CEO Membership of New Zealand Boards: Determinants and Firm Performance

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Abstract

This study primarily investigates the determinants of CEO membership of New Zealand (NZ) boards, and the effect of CEO board membership on firm performance, for publicly-listed NZ firms between 1997 to 2008. The project is conducted using a unique hand-collected panel dataset containing information about CEO participation on the board, firm characteristics, firm performance, ownership, and firm governance. The sample covers the twelve-year period.

The sample statistics of CEO board membership reveal that on average, approximately 30% of NZ CEOs do not sit on their company board. In addition, the number (percentage) of incidences of CEOs off their company board has been increasing. Specifically, the percentage of CEOs off the board was approximately 20% in 1997 but 42% in 2008.

Models examining the determinants of CEO board participation indicate that the probability of CEO board membership is significantly related to the opacity of firms' information environment and the strength of firms' governance environment. Specifically, the probability of CEO board membership is significantly affected by firm size, firm age, percentage of independent directors, board ownership, and multiple directorships in independent companies. In particular, firm size and percentage of independent directors on the board possess economic significance. The negative association between the probability of CEO board membership and the strength of firms' governance environment is consistent with CEO utility maximization.

I also find that although CEO board membership is positively related to ROA, ROE and Jensen's alpha in basic regression models, the positive effect observed in accounting performance models disappears after controlling for self-selection. In other words, firms with better accounting firm performance tend to appoint their CEOs on the board. This may attribute to the possibility that CEO board membership is optimally determined by shareholders. The evidence from a market-based model also reflects shareholder interests after controlling for the negative self-selection behavior.

As an additional analysis, I examine the determinants of different degrees of CEO board involvement where CEOs on the board are categorized into CEO-director and CEO

duality (the CEO also holds the position of the chairman of the board). This analysis shows that a number of explanatory variables have a non-linear relationship with the degree of CEO board involvement. For example, CEO board involvement is negatively related to firm age and multiple directorships in independent companies but positively related to their squared terms. To the contrary, CEO board involvement is positively related to Tobin's Q ratio and percentage of independent directors but negatively related to their squared terms.

Moreover, basic regression results examining the effect of the extent of CEO board involvement on firm performance reveal that dual firms and CEO-off-the-board firms are associated with lower accounting firm performance than CEO-director firms, but dual firms are associated with better Jensen's alpha and CEO-off-the-board firms are associated with lower Jensen's alpha. The robustness analysis finds that the negative effect of CEO duality on operating performance is significantly mitigated by self-selection and the effect of CEOs off the board on operating performance is intensified by self-selection. In other words, after taking into account the self-selection bias, CEO duality status provides strong evidence for CEO utility maximization whereas CEOs off the board are optimally chosen given the underlying characteristics. However, the results from the market-based models show the exact opposite story after controlling for the self-selection bias: CEO duality is optimally chosen whereas the costs of CEOs off the board are greater than their benefits in firms with CEOs off the board, providing evidence for CEO utility maximization.

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Chapter 1

Introduction

1.1 Overview

A chief executive officer (CEO) of a company is appointed to be in charge of day-to-day operations of the company on behalf of shareholders. The shareholders expect the CEO to behave in a way that can increase firm value and thus maximize their own wealth. The CEO, on the other hand, has personal incentives to maximize personal interests. This may be achieved in the following four ways. First, CEOs may develop entrenchment strategies to secure their position. The Investor Responsibility Research Center (IRRC) identifies twenty-four entrenchment provisions that may benefit executives and may or may not harm shareholders. Gompers et al. (2003) find that an index based on these twenty-four provisions, giving each IRRC provision equal weight, was negatively correlated with firm value and stockholder returns during the 1990s. Second, CEOs may devote insufficient effort to fulfill their responsibilities. For instance, they may tend to be less confrontational when they find resources in the companies have been used in a less efficient way (Bertrand and Mullainathan, 1999). Specifically, CEOs may be reluctant to switch to another supplier although they know the current supplier is more costly. Instead, they may find it more important to spend their time and efforts to set up their own network. Third, CEOs may engage in extravagant investments. CEOs may prefer to invest in projects that are not profitable from shareholders' perspective but allow for personal gains. Last, CEOs may be involved in self-dealing behaviors, such as excess perks consumption or conducting business with companies that are directly or indirectly owned by themselves. Jensen and Meckling

(1976) conclude CEOs take advantage of shareholders by involving in managerial shirking, excessive perks consumption and non-optimal investments.

CEOs' behavior of maximizing their own benefits at the expense of shareholders' is an example of an agency problem. Jensen and Meckling (1976) define an agency relationship as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf, involving delegation of some decision-making authority to the agent. The agency problem occurs because the chosen agent(s) does not bear a substantial portion of the wealth effect of their actions and the principal(s), on the other hand, bear the full risks of these actions instead. Jensen and Meckling (1976) describe firms as "a nexus of contracting relationships". One of the contracting relationships is between the CEO (the agent) and shareholders (the principals). The relationship between the CEO and shareholders is characterized as an agency problem because the CEO is delegated with the authority to be responsible for the daily operations of the companies whereas the shareholders bear the residual outcomes of these actions.

In order to solve this problem, shareholders have to monitor CEOs' behavior. However, monitoring is difficult due to dispersed ownership. The ownership is dispersed for three reasons: first, individual investor's wealth is limited so they can only purchase a portion of a business' shares; second, the individual investor herself probably wants to invest a fraction of their wealth to diversify into other assets and third is the concern for liquidity as it is always easier to sell a small number of shares. Dispersed ownership leads to the problem of free riding since all shareholders can claim the benefits of an improved performance resulting from a few shareholders' monitoring. To overcome the collective problem due to the dispersed ownership, a board of directors is hired to act as one of the monitoring mechanisms to monitor CEOs' behavior.

Monitoring effectiveness can be affected by the structure and composition of the boards of directors. For example, when the CEO of the company is involved in the board activities, the monitoring role of the board may be compromised because the CEO is part of the team to assess his own work. This raises the issue of CEO board involvement. There are three levels of CEO board involvement. When CEOs are off their company boards, they are not involved in the board activities and this level represents the lowest level of CEO board involvement. When CEOs are official members of the boards but only

serve as directors, they have obligations to fulfill the boards' duties. At the other end of the spectrum is CEOs holding the chair position of the boards (CEO duality). This represents the highest degree of CEO board involvement because the chairman not only has to fulfill a director's responsibilities, but usually also has additional responsibilities that grant them greater power. This research refers to the combination of the latter two degrees of CEO board involvement as CEOs on the board or CEO board membership. The primary objectives of this thesis are to (i) explain what determines variation in CEO board membership, and (ii) determine financial implications of the different choices.

1.2 Motivations and Academic Contributions

Obviously, any attempt to examine these issues empirically requires a setting where there is a significant variation in CEO board membership. In fact, situations where the CEO is off the board are rare. Leblanc and Gillies (2005, p92) claim that "(i)t is almost unheard of for the chief executive officer of the corporation not to be a member of the board of directors. Indeed, in many companies, particularly in the United States, it is not unusual for the role of the board and CEO to be combined." For example, Klein (1998) reports that 99.4% of US firms from a sample size of 485 had the CEO sitting on the board in 1992 and 98.6% out of a sample of 486 in 1993. Fernandes (2008, p32) also mentions that "the corporate board of the [Portuguese listed] company includes the CEO and a varying number of other board members, who can be either executive or nonexecutive." Zhou (1999) states that CEO board membership is a common practice in Canada. Even in countries where CEO duality is relatively less common, there is a lack of studies focusing on the issue of CEOs on the board or off the board. Hence, the statistics of CEO board membership in these countries are hard to find in the literature. Veprauskaitė and Adams (2013) report that during the period of 2003 and 2008, the CEO held the chairman position in 7% of firm-years in the UK firms. Donaldson and Davis (1991) mention that most Australian large firms have a chairman who is independent of the company CEO. For example, Monem (2013) reports 65% of the sample firms have CEOs separated from the chairman role in Australia. Although the incidence of CEO duality is low in these countries, the statistics of CEO board membership status are left unmentioned and the research on whether the

CEO is on the board or off the board is virtually nonexistent.

Nevertheless, NZ provides a setting to fill in this gap. Boyle and Ji (2013) document that about one-third of NZ CEOs do not sit on their company board.[1]; similarly, Roberts (2007) finds the proportion of firms that had CEOs on the board was between 66% and 73% with a decreasing trend for the period between 1997 and 2002; with a sample of 80 New Zealand public sector companies, Cahan et al. (2005) report 13 (or 16.25%) of them have their CEOs on the board. The data suggests that there were more CEOs not involved on the board at all in NZ. This relatively more balanced dataset on CEO board membership in NZ provides motivation and an opportunity to investigate the issue of separation of the CEO from the board.

The research contributes to the body of academic knowledge relating to CEO board involvement in two main ways. First, this research fills in a gap in the corporate governance literature relating to CEO board membership. CEO participation in NZ boards being more diverse compared to other countries allows me to extend current CEO duality research to the topic of the CEO on the board or off the board. In other words, this unique NZ institutional characteristic provides important data to analyze the determinants and financial implications of CEOs on the board. By examining these issues, it provides a staring point for the analysis of the inclusion of an additional layer of CEO board involvement and documents evidence for CEO board membership studies.

Second, this research makes significant contributions to the NZ corporate governance literature. In the past, NZ corporate governance studies have focused almost exclusively on the relationships between certain board characteristics and firm performance (eg, Hossain et al., 2001, Prevost et al., 2002b, Reddy et al., 2010, Elayan et al., 2003). A much smaller body of work has examined the determinants of board characteristics themselves. For example, Mak and Roush (2000) use 1980s IPO data to examine the prevalence of CEO duality. In addition, the sample of this research is comprised of observations over a twelve-year period spanning 1997 to 2008. The twelve-year sample period provides the most comprehensive descriptive data on NZ governance studies and a clearer picture of how firm characteristics and board characteristics change over time.

[1]They document 64% of firms had CEOs on the board in 1995 and 66.7% in 2010.

1.3 Thesis Outline

This thesis is organized as follows. Chapter 2 provides the background and prior research that guide the establishment of a theoretical framework for this study. Chapter 3 provides the theoretical framework. Chapter 4 describes NZ institutional environment, data sources and general properties of the data. Chapter 5 and Chapter 6 examine the determinants and financial implications of CEO board membership, respectively. Chapter 7 conducts case studies of firms that changed CEO board membership choice over the sample period. Chapter 8 concludes.

Chapter 2

Literature Review

This chapter reviews existing literature relevant to the discussion of the determinants and financial implications of CEO board membership. The organization of this chapter is as follows. Section 2.1 reviews the literature on the theoretical foundation that underlaid much of the empirical work on CEOs' role in corporate governance that followed. In addition, this section also presents the main overseas regulations and guidelines that focus on CEO board involvement. One major concern for CEO board involvement is that it may compromise board independence, which diminishes boards' functionality. Hence, the questions to be asked are: Does CEO board involvement compromise board independence and if so does board independence matter? In order to examine these questions, I review literature on two major aspects of board independence in Section 2.2. One is CEO duality - a topic that is the closest to and also a small part of my topic and the other one is independent directors on the board. Literature on the theoretical background, along with literature on CEO duality and independent directors, form the basis for the discussion of CEO board membership issue.

2.1 Background

2.1.1 Theoretical Background

The footstone theory underlying the study of CEO board membership is the separation between firm owners and managers. This problem was first observed by Smith (1776,

p741):

> The directors of such companies, however, being the managers rather of other peoples money than of their own, it cannot well be expected that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their masters honor, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company. It is upon this account, that joint-stock companies for foreign trade have seldom been able to maintain the competition against private adventurers. They have, accordingly, very seldom succeeded without an exclusive privilege; and frequently have not succeeded with one. Without an exclusive privilege, they have commonly mismanaged the trade. With an exclusive privilege, they have both mismanaged and confined it.

These remarks were not seriously studied until Berle and Means (1932) and Larner (1966), who provided the early studies that discussed separation between firm owners and managers in large US corporations. Similar to Smith (1776), Berle and Means (1932) also expressed concerns for the alignment of interests between managers and shareholders. They argued that "[firms] consisting of a set of relationships under which an individual or set of individuals hold power over an enterprise but have almost no duties in respect to it which can be effectively enforced" (p305). This phenomenon was later defined by Jensen and Meckling (1976) as the agency relationship. The introduction of the agency theory and definition of "agency cost" by Jensen and Meckling (1976) provide a theoretical background for the following decades of empirical research on CEOs' role in corporate governance, in particular CEOs' participation in the board activities.

An agency relationship is formed when the principals (shareholders) delegate authority to the agents (CEOs) and the wealth of the former is affected by the actions of the latter. The agency problem arises from two aspects. First, the interests of principals and agents are sometimes different. Second, due to the diverging interests between the principals and

the agents, monitoring of the agents' behavior is necessary. However, the monitoring incurs costs and the principals cannot perfectly monitor the actions of the agents without incurring costs. Therefore, the possibility of the agents' opportunistic behavior contradicts the principals' wealth maximization expectation.

2.1.2 Regulations and Guidelines

Due to the potential agency problem, the governance of firms is a major concern for shareholders. The McKinsey "Global Investor Opinion Survey 2002"[1] finds that the percentage of institutional investors who consider the quality of firms' governance (defined as effective boards of directors, broad disclosure, strong rights and equal treatment for shareholders) as being more important than a firm's financial issues (eg., profit performance and growth potentials) ranges from 7% to 40% across the continents, with the higher percentage being in emerging markets. While the percentage of institutional investors who believe corporate governance is at least as important as financial issues ranges from 56% to 85%. A significant majority of investors are willing to pay a premium of 10% to 40% for a well-governed company. Given their measurements of corporate governance, 44% of the investors prioritize the independence of the boards and 38% of them require effective board practices (multiple responses possible). Gillan (2006) also claims that the boards of directors are often believed to be one of the important governance mechanisms shareholders can employ in corporate governance.

Due to the importance of the boards of directors in corporate governance, various corporate governance guidelines and codes have been developed over the last 25 years.[2] These guidelines and codes set out recommendations for the responsibilities of corporate boards of directors. One of the key recommendations is to ensure the independence of the board, which aims to improve the quality of board oversight. For example, the Cadbury

[1] see http://issuu.com/rajeshh/docs/global_investor_opinion_survey_2002/1?mode=a_p

[2] For example, Principles of Good Corporate Governance and Best Practice Recommendations in Australia; The Toronto Report in Canada; Code of Best Practice in Hong Kong; Recommendations on Corporate Governance in France; Corporate Governance in New Zealand: Principles and Guidelines in New Zealand; Code of Corporate Governance in Singapore; Cadbury Report in the UK and Sarbanes-Oxley Act in the US.

Report issued in 1992 in the United Kingdom (UK) (Cadbury, 1992) is considered to be the pioneer in recommending a more independent board. It recommends that the board of publicly traded corporations includes at least three non-executive directors and that the CEO and chairman positions be held by two different individuals. Following the Cabury Report, at least 18 countries issued similar recommendations between 1993 and 2000 (Dahya et al., 2002).

Various corporate scandals and failures in 2002 attracted even greater attention from regulators, institutional investors and the business press on the corporate governance issue, particularly on board independence. The Sarbanes-Oxley Act of 2002 and NYSE exchange regulation in the United States introduced provisions regarding more important roles of the board of directors. For example, a majority of independent directors is now required (Corporate Governance Listing Standards Section 303A.01) and the compensation committee must be comprised solely of independent directors (Corporate Governance Listing Standards Section 303A.05). The 2007/2008 sub-prime mortgage scandals and the resulting financial crisis have reignited the debates on the importance of corporate governance and the roles of the board of directors in particular.

2.2 Literature Review on Board Independence

The focus of board independence originates from the argument that one of the major responsibilities of the board of directors - monitoring - is closely related with board independence. Monitoring of the management may not be effective or even realized without an independent board. As noted by Hillman et al. (2008), monitoring of the top management requires abilities and motivations from the board of directors. In fact, both of them can be affected by board independence, such as CEO involvement in the board activities. For example, given the information advantage, self-serving CEOs, who sit on the board, are able to divert board attention away from monitoring and direct board discussions towards their personal interests, which makes monitoring more difficult by other board members. In addition, with CEOs sitting on the board, other directors may be discouraged to ask "tough" questions and they may want to be less confrontational for their own benefits. Tuggle et al. (2010) find that CEO duality, which represents the highest degree of CEO

board involvement and thus the least of independence, is negatively related to the board's allocation of attention to monitoring. The conventional view is that a more independent board is believed to be better at providing monitoring of CEOs' actions. Better monitoring may help to reduce the agents' opportunistic behavior, which helps to improve firm value and shareholder wealth.

However, a few studies have also offered potentially positive aspects of a less independent board. For example, Brickley et al. (1997) proposes an information conduit argument for CEO duality. He argues that given CEOs' information advantage, CEO duality reduces information transfer costs. In addition, Adams and Ferrira (2007) and Urtiaga (2000) highlight that inside directors can be viewed as an additional source of information to the board. Independent directors, on the other hand, have limited knowledge of the operation of the company, and may even have limited knowledge of the industry the company operates.

Despite the lack of literature directly related to the CEO board membership issue, an extensive amount of research has been conducted on two aspects of board independence - CEO duality and independent directors. The next two sections are devoted to review prior literature on CEO duality and independent directors, both of which affect board independence, hence monitoring effectiveness.

2.2.1 Literature Review on CEO Duality

CEO duality refers to the case where CEOs also chair the board of directors. A chairman of a board, or the leader of a board, is responsible for ascertaining that the board adequately ratifies and monitors the strategic initiatives of CEOs, and oversees the selecting, replacing, evaluation and compensation of CEOs. Chairmen are often selected by the board members to ensure all essential matters are on the board meeting agenda for discussion, preside over board meetings, ensure directors receive accurate, timely and clear information to enable them to make sound decisions, and lead the board to consensus from different point of views from board members. The Australian Institute of Company Directors (2006) states that they may have additional responsibilities outside the boardrooms including external relations, such as meeting with shareholders, institutional investors, the media and other public relations. Florou (2005) points out that chairmen have more power than other

directors because they can influence directors' opinion by advising them what they should say on the board meetings.

Given the role of a chairman, should a firm's CEO also serve as the chair of the board of directors? In order to answer this question, an extensive literature investigates determinants and financial implications of CEO duality. The academic research on this topic, both theoretically and empirically, provides mixed results.

Fama and Jensen (1983) and Jensen (1993) argue that CEO duality violates the fundamental rule of separation of decision-management from decision-control, which puts the CEO in the best position in a firm to expropriate shareholder interests. CEO duality provides the CEO with the highest power in the corporation both at the operational level and strategic and monitoring level. The enormous power induced by CEO duality increases the difficulty of monitoring these CEOs effectively by the board of directors, which leads to an increase in agency costs - the entrenchment theory (Fama and Jensen, 1983, Jensen, 1993, Lipton and Lorsch, 1992). Fama and Jensen (1983) argue that separation of CEO and chairman of the board can effectively mitigate the agency problem by limiting the power of the former.

Jensen (1993), followed Fama and Jensen (1983)'s argument, further extends their logic by proposing the costs of CEOs being the chairmen:

> The function of the chairman is to run board meetings and oversee the process of hiring, firing, evaluating, and compensating the CEO. Clearly the CEO cannot perform this function apart from his or her personal interest. Without the direction of an independent leader, it is much more difficult for the board to perform its critical function. Therefore, for the board to be effective, it is important to separate the CEO and Chairman positions (p866).

Even though there was no mandating provision with regard to the board leadership structure, the US Securities and Exchange Commission (SEC) and the Dodd-Frank Act require listed companies to disclose whether and why they have chosen to combine or separate the CEO and board chair positions, as effective since March 2010.[3]

Despite the strong theoretical support for the separation of the two positions, a

[3]See http://www.sec.gov/rules/final/2009/33-9089.pdf

majority of public firms in the US adopt a combined board leadership structure. For example, Kesner et al. (1986) document that 89% of the US firms in their study adopted a combined position of CEO and chairman in the period from 1980 to 1983; Brickley et al. (1997) report over 80% of CEO duality cases in a sample of large US firms in 1989; Grinstein and Valles (2008) find 76% of a sample of about 1,000 firms that belong to the S&P 1500 index adopted a dual structure in 2000 and 71% in 2004.

McLeod (2003) questions "if this was so obviously always in the interests of shareholders, 90 percent of US companies would not combine these roles, as they do, and the New York Stock Exchange and Nasdaq would have rules prohibiting the practice, which they don't" (p7). According to a 2007 survey conducted by MacKenzie Partners, shareholders have rejected proposals requiring an independent chairman approximately 97% of the time since such proposals have been introduced in 2002 (Yang and Zhao, 2012).

The advocates for CEO duality argue that there are benefits associated with CEO duality. The major benefit of CEO duality is that it reduces information transfer costs. As argued by Brickley et al. (1997), CEOs have more specialized knowledge regarding the operations of the companies and the opportunities and risks faced by the firms. CEOs' daily operational involvement in the companies creates information asymmetry between the CEO and the chairman of the board and this information asymmetry urges the chairman to rely on the CEO on a regular basis to provide accurate and timely information. Yet, specific information is costly to transfer (Fama and Jensen, 1983). Dual leadership minimizes information acquisition and processing costs, particularly with regards to firm-specific information.[4] These dual CEOs are more capable to ensure that important matters are on the agenda for board discussion and convey the information to the board in a more accurate and timely manner.[5]

Second, CEO duality improves decision-making efficiency. CEO duality enables faster and more frequent decision-making than a separate leadership structure because the former eliminates an extra chain of command. Specifically, no time and information are lost as

[4]Firms frequently cite CEOs' firm-specific knowledge as a reason for adopting dual leadership (Yang and Zhao, 2012).

[5]See http://www.sec.gov/Archives/edgar/data/865436/000104746909000379/a2190055zdef14a.htm for the 2009 proxy statement of Whole Foods Market,Inc.

information is transferred from the CEO to the chairman or because decisions need to be ratified by the chairman.

Third, CEO duality can ensure a consistent management style. Some CEOs may not want the chairman's interference when managing the firms because they may have a different working style from their chairmen. For example, AIG CEO Robert Benmosche said to Chairman Harvey Golub: 'we have a difference in style. We can't work together. I need a partner who I can bounce ideas off and give me advice, and I don't have that kind of relationship with you where we can be casual with our thinking'.[6] Golub resigned from his chairman position within one year the company split the role of CEO and chairman.

Other benefits of CEO duality include facilitating accountability of decision-making (Jeffrey and R.Salancik, 1978). Separation of the CEO and the chairman can make it difficult to pinpoint responsibilities when it comes to bad firm performance - it may give the CEO or chairman an opportunity to blame each other, which would not happen in the case of combined leadership. CEO duality, on the other hand, creates a situation where there is no space for doubt as to who has authority or responsibility over a particular matter (Donaldson and Davis, 1991, Anderson and Anthony, 1986). Furthermore, CEO duality provides a strong leadership image, avoids confusion and duplication. Having two spokesmen will potentially cause public confusion about the authority of the company, which will damage the reputation of the company (Lorsch and Lipton, 1993) and may have a negative impact on either the chairman or the CEO.[7] For example, GM chairman Edward Whitacre clashed publicly with the CEO Frederick Henderson on the company's initial public offering and the speed of re-structuring in 2010 (Wong, 2010). Because of Whitacre's interventionist style, Whitacre claimed the CEO title two months after the company fired Henderson.

After recognizing the benefits and costs of CEO duality, Brickley et al. (1997) argue

[6]See http://online.wsj.com/article/SB10001424052748703722804575369521964163344.html

[7]In their 2009 proxy statement, Office Depot states that '[t]he Board has given careful consideration to separating the roles of Chairman and Chief Executive Officer and has determined that the Company and its shareholders are best served by having Mr. Odland, serve as both Chairman of the Board and Chief Executive officer. Mr. Odland's combined role as Chairman and Chief Executive officer promotes unified leadership and direction for the Board and executive management and it allows for a single, clear focu for the chain of command to execute the Company's strategic initiatives and business plans'.

that it is not possible to suggest one single board leadership structure for all firms because both board leadership structures have benefits and costs. That is, CEO duality only occurs when the benefits of doing so outweigh the costs. Under this theory, firms self-select into a board leadership structure that maximizes their firm performance, hence shareholder wealth. Similarly, Dey et al. (2009) and Chen et al. (2008) argue that firms are likely to choose a board leadership structure that can maximize firm performance based on a firm-level assessment of benefits and costs of the two alternative structures.

The empirical evidence of the effect of CEO duality on firm performance is mixed. In support of the separation of the CEO from the chairman position, several studies find a negative relationship between CEO duality and firm performance. Rechner and Dalton (1991) examine financial performance of firms that adopted CEO duality and those that did not during the period of 1978-1983 in the US. They find that firms whose CEOs were not the chair of the board persistently outperformed the firms with CEO duality during the 6-year time period in terms of return on investment, return on equity and profit margin. Pi and Timme (1993) study 112 US banks and find that firms with separate titles outperformed dual firms in terms of return on assets between 1987 and 1990. Similarly, Bhagat and Bolton (2008) and Bhagat and Bolton (2009) find that CEO duality was significantly negatively related to contemporaneous return on assets (ROA) and subsequent ROA between 1998 and 2001 and was significantly negatively related to contemporaneous ROA between 2003 and 2007. However, it was unrelated to stock returns and Q ratios between 1998 and 2007. Balsam and Upadhyay (2009) also find a positive and significant relationship between a separate board leadership structure and firm performance measures with various estimation methods. In addition, they find that the benefits of having a separate chair depend on the characteristics of that chair. That is, the positive and significant relationship is only realized when the chair is independent, and the relationship is ambiguous when the chair is characterized with linked chair and employee chair. This finding suggests that the positive relationship between a separate chair and firm performance is only possible when the chair is truly independent.

Other studies have found supporting evidence for a dual structure. For example, Boyd (1995) finds a positive and significant relationship between CEO duality and subsequent firm performance after controlling for the interactions between duality and different

organizational environments. Donaldson and Davis (1991) also document that CEO duality is associated with superior return on equity (ROE). By studying 661 US firms in the 1989 *Forbes* compensation survey, Brickley et al. (1997) find dual firms are associated with better accounting performance.

If the agency theory is relevant in explaining the observed board leadership structure, a significant change in share price should be expected when an announcement of a change in board leadership structure is made. Brickley et al. (1997), Baliga et al. (1996) and Palmon and Wald (2002) look at the announcement effect of a change in leadership structure on stock market returns in the US. Contrary to expectation, they conclude there is no statistically significant evidence to show CEO duality leads to an adverse share market reaction. This provides opposing evidence of the agency problem associated with CEO duality. In fact, if anything, the opposite is true even though the result is not statistically significant. Therefore, they tentatively suggest that the regulation about the separation of management and control may not be the best practise to follow for large US firms. Baliga et al. (1996) explain the insignificant results as that it may take more than two years, their measurement window, to show the effect of the change in board leadership structure on firm performance. Furthermore, the change may have been well anticipated by the market and therefore have already been reflected in the existing stock price.

In support of the argument proposed by Brickley et al. (1997), a number of studies find that the relationship between CEO duality and firm performance is statistically insignificant. For example, with the evidence of self-selection, Chen et al. (2008) do not document a significant relationship between CEO duality and firm performance nor improvement in firm performance after change in leadership structure. Elsayed (2007) examines the relationship between CEO duality and firm performance using least absolute value regression, which is the median regression model, to deal with the presence of severe outliers. He finds CEO duality has no significant impacts on return on assets and Tobin's Q ratio. However, when he interacts industry dummies with CEO duality in the analysis, the result shows a significant relationship between CEO duality and Tobin's Q ratio. This means firms' board leadership structure may have a differential impact on financial performance across industries. Dey et al. (2009) also find if firms with higher predicted value of duality based on economic determinants separate the CEO and the chairman, they suffer from lower

subsequent returns and lower contributions of investments to shareholder wealth. This result is more pronounced for firms that claim to split due to investor pressure. Hence, they suggest that firms that split to comply with the regulations should consider their unique circumstances.

Overall, there is a lack of consensus on the relationship between CEO duality and firm performance. Kang and Zardkoohi (2005) conduct a literature search for articles about the examination of the relationship between CEO duality and firm performance with various measures published in key journals between 1978 and 2003. Of the 30 empirical studies, they document 34% report no significant relationship, 4% report a significant negative relationship and 1% report a positive relationship and 50% report mixed results with significant as well as non-significant relationship.

2.2.2 Literature Review on Independent Directors

Another major proxy for board independence is independent directors on the board. A general agreement in the conceptual literature is that an effective board should be comprised of a greater proportion of independent directors (Zahra and Pearce, 1989). The voices from regulators, institutional investors and the media have also reached a near consensus on this issue. The argument for an outsider or independent director dominated board largely lies in the conventional wisdom that such a board is associated with improved firm performance since independent directors are less affiliated with the management, they are more effective in performing their monitoring role.

Several studies have examined the effects of outside (non-management) directors in performing board tasks. For example, Weisbach (1988) examines the relationship between outside directors and CEO turnover. After controlling for ownership, size, and industry effects, he finds that the association between past firm performance and the probability of CEO turnover is stronger in firms with at least 60% independent directors (outsider-dominated boards) than other boards (insider-dominated boards). Brickle et al. (1994) find evidence that outside directors can better protect shareholders' interests. Specifically, they find that the effect of announcements of poison pills on stock market returns is positive when the board is outsider-dominated and negative when it is insider-dominated. Wright

et al. (2002) find post-acquisition CEO compensation changes are based on performance when the board is more independent, while post-acquisition CEO compensation changes are based on firm size when the board is comprised of fewer outside directors.

Collectively, these studies reach a general consensus that a board with a greater percentage of outside directors is a better monitor, which may help to improve firm performance. Coles et al. (2008), however, raise the question of the existence of boards with higher insider concentration. They investigate the relationship between firm performance and board independence and they find that boards with a higher fraction of insiders do not necessarily reduce firm value. To the contrary, when firm-specific knowledge of insiders is relatively more important, a positive association between representation of insiders and Tobin's Q ratio is observed. Based on these results, they suggest that the mandate regulations that place requirements on the percentage of outside directors on the board may hurt some firms. Similarly, Bhagat and Bolton (2008) also find that the percentage of independent directors on the board is negatively related to subsequent ROA and stock market returns, and this result is robust across different estimation methods. Yermack (1996) reports a negative association between the proportion of independent directors and Tobin's Q ratio with the OLS estimation technique, but this effect vanishes in a fixed effects model. Bhagat and Black (2002) document a negative relationship between board independence and firm performance in supermajority-independent boards (this translates to an independence level of 0.4 or higher or for a typical eleven-member board with one affiliated directors, to eight or nine independent directors and only one or two insiders). The evidence from these studies seems to suggest that some firms may benefit from at least a moderate number of inside directors on the board.

Given the literature on CEO duality and independent directors, CEO board membership also has both positive and negative aspects. For example, the major benefit of CEO board membership may be that CEOs on the board may serve as an information conduit channel. CEO board membership allows CEOs to participate in the discussions of board meetings and decision-making process and this may help to reduce the information transfer costs. The major cost of CEO board membership may be that it increases the agency costs. For instance, the opportunities to participate in the board meetings and decision-making process may allow self-serving CEOs to direct the group discussion towards their personal

benefit. Various benefits and costs of CEO board membership will be discussed in full detail in Chapter3.

To sum up, prior literature has generally agreed that board independence can influence corporate financial performance. However, given the mixed results, there is still no agreement on through which mechanism the board of directors can improve their effectiveness as an instrument of corporate governance, which in turn, leads to better firm performance. The analysis of the issue of CEO board membership provides additional tests that whether this newly investigated aspect of board independence plays an important role in affecting firm performance.

Chapter 3

Theoretical Framework

This chapter provides the theoretical framework for the analysis of the CEO board membership issue. Two strands of theories are relevant in explaining the observed CEO board membership and I label them "shareholder value maximization" and "managerial utility maximization".[1] The underlying assumption of both approaches is the self-serving nature of shareholders and CEOs. In order to serve their personal interests, shareholders and CEOs may have their own preference for the choice of CEO board membership. Whether the choice is driven by shareholder interests or CEO interests may be also manifested through firm performance. The rest of this chapter is devoted to the discussion of the shareholder value maximization perspective and the managerial utility maximization perspective.

3.1 Shareholder Value Maximization Approach

Based on the idea of Brickley et al. (1997) that CEO duality has both benefits and costs, I argue that CEO board membership also has benefits and costs. Under the shareholder value maximization approach, the observed CEO board membership is an optimal response to the firms' operating environment after considering the benefits and costs of each alternative. The choice of CEO board membership differs due to the variation of their unique operation

[1]The idea of explaining CEO board membership from these two approaches is inspired by Bebchuk and Fried (2003), who categorize two ways through which the agency problem and CEO compensation is linked - one is "optimal contracting approach" and the other is "managerial power approach".

environment. Firms assess the benefits and costs of each alternative and CEOs on the board are more likely in firms that benefit most or suffer least from such an arrangement. Since the shareholder value maximization approach acknowledges not only the costs associated with CEO board membership but also the benefits, CEO board membership decision based on this theory maximizes shareholder wealth. To explain this issue further, it is important to identify the benefits and costs of CEO board membership. This is the issue that I will now turn to.

3.1.1 Benefits of CEO Board Membership

Information Transfer Efficiency

The major benefit of CEO board membership is that it reduces information transfer costs. Information transfer costs refer to the ease with which information relevant for decision-making can be transferred from the CEO to the board. In order to transfer useful information to the board members, CEOs first collect information from various sources (eg., other managers, experts etc.). As argued by Brickley et al. (1997), CEOs have more specialized knowledge regarding the opportunities and risks faced by the firms due to their daily involvement in operations of companies. After the information collection, CEOs pass the information to the board of directors. This information is important to the board to perform their functions, such as monitoring CEOs, deciding future directions and developing strategies. Without this information, monitoring and advising become difficult. However, as argued by Fama and Jensen (1983), specific information is costly to transfer.

One obvious information transfer cost is the information lost during the transfer process. This may arise from two sources. First, it is reasonable to assume the CEO is only able to obtain a certain percentage of the total information, where the total information is defined as all information relevant for decision-making which includes firm-specific information and industry-specific information. Some information is lost when transferred from other sources to CEOs. Second, during the information transfer process between the CEO and the board of directors, the board only receives a certain percentage of the CEO's possession of information. Some of the apparent reasons for the loss of information include CEOs forgetting to transfer some detailed yet important information and information not

being interpreted as intended by the board.

CEO board membership lowers information transfer costs by reducing the second source of the loss of information. CEO board participation allows CEOs to participate in the discussion of board meetings and decision-making process and this helps to reduce the information transfer costs. First, group discussions can remind CEOs of some information that was missed during the first transaction of information. Second, group discussion helps to reduce misunderstanding of interpretation of information. Hence, CEO board membership makes it possible to extract more CEO "private" information, which decreases the information transfer costs. CEOs who are off the board, on the other hand, have no opportunities to participate in the board discussion, which eliminates the chances to improve the boards' knowledge.[2]

Other Benefits

There are other benefits to CEO board membership. First, it may improve the CEOs' working attitude. Given the roles and responsibilities of the board, CEO involvement in the board activities may reflect that the board has trust in the CEO and this may contribute positively to CEOs' working attitude. As suggested by Baliga et al. (1996), if the CEO feels trusted by the board of directors, he will be more enthusiastic toward his work and thus being more innovative, which may lead to a positive impact on firm performance. In contrast, the separation of the CEO from the board can create potential rivalry between the two.[3] This may divert CEOs' resources, such as time and energy, to ineffective usage.

CEO board membership provides the CEO and other board members with more opportunities to be familiar with each other. Working as a group facilitates understanding

[2]CEOs may be able to report to the board of directors without being an official member. However, without being an equal with other directors would cause the CEO reporting to the chairman instead of the board directly (Tik, 2009). Therefore, grou discussion of information with the CEO will not occur, which leads to information transfer costs.

[3]Several management literature argue that a non-duality leadership structure may create rivalry between CEO and non-CEO chairman (eg.,Dahya and Travlos (2000),Daily and Dalton (1995)). This argument may also apply to the CEO board membership issue. When the CEO is separated from the board, it may create a barrier between the CEO and the board of directors.

of each board members' opinion and working styles including the CEO. A better understanding can help to reduce problems arising from differences among the board members, which may help to improve decision-making efficiency.

3.1.2 Costs of CEO Board Membership

Agency Cost

The major cost of CEO board membership are agency costs. The diverging personal interests between the agent (CEO) and the principal (shareholder(s)) create agency conflicts and agency costs arise from aligning the interests between the two parties. Jensen and Meckling (1976) define agency costs as the sum of all costs associated with the design and implementation of incentives and control systems to align the actions of managers with the interests of owners, plus the residual loss of not solving these problems completely. For this reason, monitoring the management team, especially the CEO, is a form of agency cost resulting from the separation of ownership and control. Monitoring difficulty affects agency costs, ie., agency costs increase with the level of monitoring difficulty. Hence, agency costs are greater in firms with greater monitoring difficulty. CEO board membership provides obstacles for effective monitoring which may increase agency costs.

The major obstacle for effective monitoring arises from the increase in CEO power in the company. Following Finkelstein (1992), power is defined as an individual' ability to exert their will.[4] Although CEOs already possess operational power by default, CEO board membership increases their power at the strategic level by participating in the board activities, such as project selection, board discussion and decision-making process (Adams and Ferrira, 2007). Moreover, CEO power also comes from their information advantage. Given this advantage, it is even easier for them to direct group discussion towards their own interests, which makes it harder to monitor and evaluate CEO performance.

The increase in CEO power may result in the manipulation of project selection and

[4]Earlier studies have explored various sources of managerial power. For example, Zald (1969) identifies detailed knowledge of an organization is an important source of power. Boards of directors without a sufficient amount of knowledge have difficulty participating in the board discussion, hence influencing the decision-making process. Finkelstein (1992) also recognizes managerial power can come from managerial position, equity ownership, the role of outside directorships, and education.

productivity of investments. For example, CEO board membership may involve empowering CEOs to engage in negative net present value investment projects, which allow them to derive more personal benefits from controlling more assets (Jensen, 1986, 1993). Alternatively, instead of overinvestment or empire-building, CEOs may underinvest by foregoing some projects with positive net present value because there are private costs imposed on CEOs by undertaking additional investments, such as greater time and efforts that are needed to oversee the investment activities (Aggarwal and Samwick, 2006). These activities increase agency costs and are detrimental to shareholders' interests.

Since the separation of management and control is believed to be effective in mitigating the agency costs, CEOs should be separated from the board in an environment that is difficult to monitor. The conventional wisdom is that if CEOs are acting in the best interests of shareholders and the agency problems are under control, firm performance should be maximized.

Other Costs of CEO Board Membership

CEO board membership may make it more difficult to replace ineffective CEOs. One of the key responsibilities of the board is to hire new CEOs and fire under-performing CEOs. CEO board involvement gives the CEO more power within the company, making it harder to fire a CEO who is under-performing.

CEO board involvement may discourage sharing of leadership and discourage the board from working as a team (Conger and Lawler, 2009). This may simply be due to the possibility that directors may be reluctant to raise concerns and issues in the presence of the CEO on the board. CEO board involvement sometimes can lead to "hub and spoke" leadership style with the CEO as the dominant hub. However, shared leadership among the directors and working dynamically are the key for a high-performing board. Conger and Lawler (2009) argue that separation of management and control can increase the chance that the directors feel more at ease about discussing issues and concerns relating to the company.

3.2 Managerial Utility Maximization Approach

In contrast to the shareholder value maximization approach, where CEO board membership is a mechanism to maximize shareholders' utility, under the manager utility maximization approach the observed CEO board membership is an outcome of CEO utility maximization. This argument recognizes that CEOs have personal incentives to be involved on the board. First, CEOs increase their power within the firms by serving on the boards of directors. The privilege of participating in project selection, board discussion and decision-making process makes it easier to behave opportunistically. Second, the increased power enhances CEOs' authority image, earns greater respect from other managers and sub-ordinates, which make it easier for them to manage the firms. Third, membership on the board gives them a better reputation as qualified CEOs and an indication of their abilities. This may enhance their future prospects in the market of CEOs and they are more likely to gain an equivalent or even better job title upon resignation from their current position.

Given the incentives to sit on the board of directors, CEOs may use their power to exert more effort than necessary to achieve that outcome. As discussed in Section 3.1, CEO power can arise from various sources. For example, the CEO information advantage is an important source of power and this form of power is more prevalent in firms where acquisition and processing of firm-specific information is particularly important to the board of directors. Take another example, a number of studies have found that poor governance provides an environment that is easier for CEO manipulation, resulting in the power being concentrated in the CEOs' hand and a reduction of shareholder wealth. For instance, Core et al. (1999) document that CEO compensation is higher when (i) the board is large; (ii) more outside directors have been appointed by the CEO; (iii) outside directors serve on three or more boards. Core et al. (1999) and Cyert et al. (2002) find that CEO compensation is 20-40% higher in firms with CEO duality. Similarly, using NZ data, Roberts (2007) finds CEO compensation is higher in firms with powerful CEOs, that is, CEOs holding the chair position and sitting on the compensation committee if there is one. She also documents that CEOs are likely to experience greater increase in compensation if they are powerful and that managerial power weakens CEO pay-performance sensitivity. Given that CEO power seems to be greater in these environments, CEOs are more likely

to use their power to maximize their likelihood of sitting on the board.

Under the managerial utility maximization theory, the observed CEO board membership reflects managerial power and is an outcome of CEOs' pursuit of personal interests. Hence, it is a manifestation of CEO entrenchment behavior.

Chapter 4

NZ Institutional Environment and NZ Data Description

4.1 Introduction

The stylized fact is that New Zealand firms, unlike those in many other countries, exhibit significant variation in the extent to which CEOs are involved with their boards. This unique institutional environment provides an opportunity to explore issues surrounding CEO board membership choice. In other words, NZ provides a perfect setting to test whether CEOs being on the board is determined by shareholder value maximization or managerial utility maximization. The purpose of this chapter is to describe NZ institutional environment relevant to CEO board membership and provide general properties of NZ data.

4.2 NZ Institutional Environment

Although there are no specific regulations and guidelines mandating the role of CEOs on their company boards, various legislations, codes and guidelines are developed to emphasize the importance of the role of the board of directors in corporate governance and their independence, particularly regarding CEO duality.

Similar to other countries, the board of directors is the collective body that oversees the activities of a company in NZ. The Companies Act 1993 Section 128 (1) and (2) state "the business and affairs of a company must be managed by, or under the direction or

supervision of, the board of the company; and the board of a company has all the powers necessary for managing, and for directing and supervising the management of, the business and affairs of the company." Following the wave of legislative activities overseas since the 1990s, NZ has developed and implemented a number of legislations, codes, and guidelines that promote better corporate governance. For example, the Companies Act 1993 was designed to expand the duties and liabilities of directors. The motivation for the passage of the Act, according to Law Commission 1989, is that the previous company law associated with the duties of directors was "inaccessible, unclear and extremely difficult to enforce". The new legislation addresses directors' duties and the level of care the directors have to exercise. Specifically, the Act states that "directors were to act in good faith and in what they believe to be the best interests of the company (section 131), exercise power for a proper purpose (section 134) and never cause or allow the business of the company to be carried out in such a way that creates a risk of serious loss to the company's creditors" (section 135).

The significance of the Act is that directors are held legally liable for any breach. In other words, any breach leads to criminal charges. For example, the directors of Feltex were charged with breaches of the Financial Reporting Act 1993 due to failure to disclose certain banking covenants and misclassification of debt in their 2005 financial report. Despite the directors claim that at the time they signed the documents they believed the statements met all the required accounting standards for a listed company, they failed to fulfill their duties and meet their obligations to shareholders because the investors were not informed of the situation.

The New Zealand Exchange (NZX, formerly known as NZSE) has specific requirements to publicly-listed companies through its listing rules, particularly in relation to the conduct of directors. The NZX proposed a set of corporate governance rules, formally known as the Corporate Governance Best Practice Code or the NZX Code, for its listed companies on May 6, 2003. The NZX Code was developed in consultation with listed firms and the Securities Commission. In recognition of the pressures firms face, only a part of the Code was then incorporated into the Listing Rules of the NZX and became effective in October, 2003. The NZX Code includes the mandatory standards for all listed companies to follow and a more flexible set of principles that enable individual firms to

develop unique corporate governance practices given their operating environment. The mandatory standards on board composition (independent directors) and audit committee were enforced through amendments to Section 3.3 of the Listing Rule while the requirement for a separate board leadership structure was incorporated into Appendix 16 of the Listing Rule.[1] However, it is not clear whether any non-compliance with Appendix 16 would incur a penalty (eg.,censure, suspension, and delisting). On the other hand, the flexible standards are to be monitored by disclosure in their annual reports (it requires all listed companies to disclose information that is materially different from the principles set out in the NZX Code).

The Securities Commission published "Corporate Governance in New Zealand Principles and Guidelines" (Commission et al., 2004) in February 2004. The report sets out nine principles of corporate governance for application within a broad range of entities. Section 2.5 explicitly addresses:

> The chairperson of a publicly owned entity should be independent. No director of a publicly owned entity should simultaneously hold the roles of board chairperson and chief executive (or equivalent). Only in exceptional circumstances should the chief executive go on to become the chairperson.

4.3 NZ Data

4.3.1 Data Sources

My sample consists of companies listed in the NZX during the period between 1997 and 2008. Helen Roberts at the University of Otago provided initial data for this sample period containing 1,400 firm-year observations. Her data contains CEO and director information, governance information and firms' financial information. CEO and director information includes CEO names, CEO board membership status, CEO tenure in the company and director shareholding; governance variables include the percentage of inside directors, board size, and various measures of director shareholding; financial information includes sales,

[1]The statement regarding to CEO duality in Appendix 16 is as follows: "A director should not simultaneously hold the positions of Chief Executive and chairman of the Board of the same Issuer."

leverage, ROA, ROE, market-to-book ratio, annual share returns and market capitalization. She deleted firms from the sample if there was insufficient disclosure of information, if they were only listed on the secondary board, if they delisted during the period, if the day-to-day operation of the business was managed by a paid professional management company,[2] or if the firms operated as trusts or funds managed by a group of executives with no individual CEO appointment.[3] Her final dataset consists of 874 firm-year observations.

Based on Roberts' sample, I further hand-collected data from firms' annual reports from NZX Company Research and New Zealand Companies Office (NZCO).[4] My sample differs from that of Roberts' in the following ways: First, I manually collect more data on corporate governance and financial statistics. Second, I have added some of her deleted companies back to my sample, primarily those removed due to the lack of compensation information, because the information disclosed in the annual reports is sufficient to serve the purpose of my research. For each of the added firms, I collect all the data mentioned above. Third, I remove some of the firms from Roberts' sample mainly because of the missing annual reports from the NZX Company Research. Altogether, I excluded 41 firm-year observations due to missing annual reports and included additional 139 observations.[5] My final sample consists of 972 firm-year observations over the twelve-year period spanning 1997 to 2008 with 152 unique companies.

4.3.2 Data Description

This section provides general properties of NZ data over the sample period between 1997 and 2008 regarding CEO board involvement and firm performance. CEO board involvement includes CEO board membership and CEO duality whereas firm performance includes ROA, ROE and share returns.

A normality test is conducted to determine whether the data is well modeled by a nor-

[2]Industry types under Investment, Property and Finance firms are sometimes managed by a firm, rather than a specific CEO.

[3]See Roberts (2007) for the number of firms that were removed from the sample between 1997 and 2002.

[4]The NZX Company Research includes New Zealand listed companies' annual reports and the New Zealand Companies Office (NZCO) contains firms' registration details and director information.

[5]See Appendix A.1 for the names of firms that have been added and removed from Roberts' sample.

mal distribution. The Jarque-Bera (JB) statistic is performed for each variable, excluding binary variables, to test the null hypothesis that the dataset is from a normal distribution. A JB value greater than the critical value suggests a rejection of the null hypothesis. For data that are heavily influenced by outliers, a winsorization process is carried out by limiting the extreme values. For example, after ranking the data from the largest to the smallest, a top 2.5% winsorization process sets the top 2.5% of the data equal to the 2.5 percentile's value. Similarly, a bottom 2.5% winsorization process sets the bottom 2.5% of the data equal to the bottom 2.5 percentile's value. Together, this process is called a 5% winsorization process.

CEO Board Involvement

CEO Board Membership

An employee is defined as a CEO if he holds the title of CEO in the annual report; if no CEO's name is disclosed in the annul report, the managing director is recorded as the CEO; if no managing director is found, the general manager is recorded as the CEO.[6] If a CEO also serves on the board and holds the title of a director, he is said to have a board membership in that company. Table 1 presents the annual statistics of CEO board membership.

Table 1 shows that far from being almost unheard of, on average, approximately 30% of NZ CEOs do not sit on their company board. Moreover, there is an increasing trend for the number (percentage) of incidences of CEOs off their company board. Specifically, the percentage of CEOs off the board was approximately 19% in 1997, but 42% in 2008.

Different Degrees of CEO Board Involvement

Table 2 reports the summary statistics of the different degrees of CEO board involvement, where CEO board involvement is categorized into CEOs off the board, CEO-director and CEO duality. CEO-director refers to the case where the CEO sits on the board as a director only. All figures are reported as raw numbers and in percentage terms. The total sample

[6]Some firms employ a firm to undertake the management role and the General Manager is simply an appointed role who does not have the authority that a CEO would demonstrate. These firms are removed from my sample.

Table 1 Summary Statistics of Annual CEO Board Membership

This table reports annual CEO board membership statistics from 1997 to 2008. The sample of firms is obtained from the NZX Company Research. The figures are reported both as raw data and as a percentage form in the parentheses. The last row of this table reports the sample size and CEO board membership for the whole sample.

Year	Total	CEO on Board	CEO off Board
1997	72	58(80.56%)	14(19.44%)
1998	81	62(76.54%)	19(23.46%)
1999	76	59(77.63%)	17(22.37%)
2000	81	62(76.54%)	19 (23.46%)
2001	87	66(75.86%)	21(24.14%)
2002	82	59(71.95%)	23(28.05%)
2003	84	62(73.91%)	22(26.19%)
2004	82	59(71.95%)	23(28.05%)
2005	81	57(70.37%)	24(29.63%)
2006	85	58(68.24%)	27(31.76%)
2007	80	46(57.50%)	34(42.50%)
2008	81	47(58.02%)	34(41.98%)
Total	972	695(71.50%)	277(28.50%)

size is 972.

From the table, there are two noticeable phenomena. First, the number of CEOs off the board has been increasing over the sample period. Second, the number of CEOs holding the chair role peaked in 2000 and then has been decreasing since 2003. The reason for the large number in 2000 is that a number of chairmen resigned and CEOs were acting as chairmen in that year. Overall, there is a significant drop in the number of firms with CEO duality. This may be the result of the enforcement of the NZX Code and the Listing Rule, effected from October, 2003. By 2007 and 2008, only New Image Group Limited had their CEO holding the chair role in my sample.

Due to the gap in the literature, no direct comparison can be made in terms of the

Table 2 Summary Statistics of Annual CEO Board Involvement

This table reports the extent of CEO board involvement summary statistics from 1997 to 2008. The data was reported as raw data and as percentages. The sample of firms is obtained from NZX Company Research. The board leadership structure information was taken from corporate governance section of companies' annual reports. The last row of this table reports the summary statistics for the whole sample.

Year	Sample Size	CEO-Director	CEO-Chair	CEO off Board
1997	72	52 (72.22%)	6 (8.33%)	14(19.44%)
1998	81	58(71.60%)	4 (4.94%)	19(23.46%)
1999	76	53 (69.74%)	6 (7.89%)	17(22.37%)
2000	81	51(62.96%)	11(13.58%)	19(23.46%)
2001	87	59(67.82%)	7(8.05%)	21(24.14%)
2002	82	53(64.63%)	6 (7.32%)	23(28.05%)
2003	84	55 (65.48%)	7(8.33%)	22 (26.19%)
2004	82	55(67.07%)	4 (4.88%)	23 (28.05%)
2005	81	54(66.67%)	3(3.70%)	24(29.63%)
2006	85	55(64.71%)	3(3.53%)	27(31.76%)
2007	80	45(56.25%)	1(1.25%)	34(42.50%)
2008	81	46(56.79%)	1 (1.23%)	34(41.98%)
Total	972	636(65.43%)	59(6.07%)	277(28.50%)

different extent of CEO board involvement. However, Table 2 shows that CEOs holding the chair role has been extremely rare in NZ. This is quite different from other countries. For example, Grinstein and Valles (2008) and Yang and Zhao (2012) report 60% - 70% of the US firms had a dual structure in the 1990s, . Furthermore, NZ shared a similar increasing trend towards a separate leadership structure. Grinstein and Valles (2008) document 23% of S&P 1500 companies had a separate CEO and chair in 2000 and 31% in 2004. Balsam and Upadhyay (2009) also find that the CEO and chairman separation increased from 24% in 1996 to approximately 40% in 2005.

Firm Performance

Return on Assets

Return on assets (ROA) is a widely used measure of firms' accounting performance. It is an indication of the net income the management has generated given the resources (total assets) available. Therefore, it is the ratio of after-tax profits to total assets. Table 3 shows the descriptive statistics of ROAs between 1997 and 2008.

Table 3 Summary Statistics of Return on Assets

This table reports ROA summary statistics from 1997 to 2008. The raw data used to compute the statistics are obtained from companies' annual reports. ROA is calculated as after-tax profits divide by total assets. The figures are reported in percentages (%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	71	4.75	4.92	8.06	25.35	-27.17
1998	80	-0.00	4.31	19.33	28.67	-97.10
1999	76	1.89	3.48	14.81	31.81	-67.33
2000	81	-69.60	3.73	493.44	22.60	-4,163.23
2001	85	-9.80	3.45	53.65	34.09	-402.42
2002	79	-2.66	5.51	38.43	60.03	-245.73
2003	80	0.73	6.58	21.68	31.87	-97.09
2004	81	1.66	7.17	22.77	28.51	-99.32
2005	81	-0.28	5.31	29.46	26.66	-205.92
2006	85	-1.05	4.53	29.36	32.35	-194.36
2007	80	-3.27	4.06	41.98	36.54	-334.10
2008	81	-3.88	4.56	50.40	21.22	-432.30
All Years	960	-6.97	4.61	147.30	60.03	-4,163.23
Jarque-Bera	1.8e+07					
Summary Statistics of ROAs for the Whole Sample after Winsorization						
All Years	960	0.74	4.61	18.15	22.37	-70.95
Jarque-Bera	2997					

Table 3 shows that the mean of ROAs during the sample period range between 4.75% and -69.60% with an overall average of -6.97%. The miserable average ROAs can be attributed to some significant negative values in the sample. For example, due to restructuring and asset disposal programs, Savoy Equity and Certified Organics had ROAs of -1587.17% and -4163.23%, respectively, in 2000. Since these companies operated under unusual conditions, the significant negative ROAs are unlikely to be repeated. Given that these ROAs are not true representations of companies' profitability and the existence of these outliers in the sample may bias the analysis results, these outliers are replaced with the average of previous year's ROA and next year's ROA. Besides these extreme outliers, there is still a high variability within the sample. A 5% winsorization process is carried out, which leads to an average ROA of 0.74%. Compared to the means, the median annual ROAs are relatively stable over the sample period, ranging between 3.45% and 7.17%.

Reddy et al. (2010) document the mean of ROAs between 1999 and 2007 of 2.84% with a median of 1.85% for the top 50 publicly-listed firms on the NZX. Their higher average ROA may be attributed to the fact that their study focuses on the top 50 firms whereas I also include small firms in my sample. This result may suggest that on average, larger firms have greater ROAs than small firms. This pattern is also found in the US studies, where firm size is generally much larger compared to NZ firms. Specifically, the average ROAs of US firms range between 5.3% and 12.5% (Adams et al., 2005, Grinstein and Valles, 2008, Bhagat and Bolton, 2009, Wintoki et al., 2012).

Return on Equity

Return on equity (ROE) is also a widely used measure of companies' accounting profitability. It is calculated as net profits divided by book value of equity. Table 4 shows the descriptive statistics of ROEs between 1997 and 2008.

Table 4 shows that the average ROE between 1997 and 2008 was -29.96% with a median of 9.09%, a maximum of 640.63% and a minimum of -15327.36%. Similar to ROAs, ROEs are seriously affected by some extreme outliers and these outliers are modified by taking the average of previous years' figure and the year after's figure. For example, after replacing the minimum value, the average ROE in 2000 becomes -5.96%. A 5% winsorization is also carried out to trim the dataset. After the winsorization, the mean of

Table 4 Summary Statistics of Return on Equity

This table reports the summary statistics of ROEs from 1997 to 2008. The raw data used to compute the statistics are obtained from companies' annual reports. ROE is calculated as after-tax profits divide by total equity. The figures are reported in percentages (%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	71	8.47	8.73	15.61	40.74	-39.85
1998	80	-1.90	7.64	43.67	79.07	-202.96
1999	80	0.08	5.84	42.18	47.62	-244.04
2000	81	-307.36	8.49	1,981.99	77.93	-15,327.36
2001	85	-35.93	7.77	244.08	640.63	-1,469.69
2002	79	-7.79	10.23	70.46	36.29	-467.76
2003	80	0.14	10.82	52.78	48.54	-400.79
2004	81	3.51	13.68	42.57	49.06	-250
2005	81	2.04	11.27	42.50	54.54	-254.88
2006	85	3.75	9.10	41.70	74.89	-258.42
2007	80	-5.12	7.83	84.41	157.15	-558.16
2008	81	-12.57	8.65	117.81	43.82	-811.70
All Years	960	-29.96	9.09	585.91	640.63	-15,327.36
Jarque-Bera	1.2e+07					
Summary Statistics of ROE for the Whole Sample after Winsorization						
All Years	960	0.05	9.09	42.17	40.79	-198.74
Jarque-Bera	7580					

the ROEs turns positive. The medians of ROEs are relatively stable over the full sample period, ranging between 3.45% and 7.17%.

Jiang et al. (2009) document an average ROE of -4.52% and a median of 9.18% between 2001 and 2005 in NZ. While the median value is similar to my statistics, the mean value is much higher compared to my value before winsorization. The reason for the difference in means may be largely explained by the difference in the sample period used.

Specifically, Jiang et al. (2009) use data of NZ listed companies from 2001 to 2005, which excludes the minimum value occurred in 2000. On the other hand, US studies document a slightly lower average ROE. For example, Chen et al. (2008) report an average ROE of -6.5% between 1999 and 2003.

Theoretically, the difference between ROA and ROE is attributable to the use of debt. While ROA measures the accounting returns generated by the amount of total resources injected in the company, ROE measures the accounting returns generated by the amount of assistance the firm gets from others. Hence, the major difference between ROA and ROE is the use of debt. They are equal if there is no debt and all else equal, ROE is greater than ROA if firms take loans. The difference between the results from Table 3 and Table 4 reveals the fact that many of the averages of ROEs being lower than ROAs between 1997 and 2008 suggest that firms are not generating better returns for equity holders than for equity holders and debt holders combined in the short term.

Stock Returns

Share return is calculated as the percentage change in the adjusted share price between the corresponding two balance dates where the share price is adjusted for dividends and share splits. Table 5 shows the summary statistics of share returns during the sample period. The figures are reported in percentages (%).

Table 5 shows that NZ firms generate average shareholder returns between -18.29% and 44.72% from 1997 to 2008 with medians ranging from -22.65% to 26.73%. Overall, the mean of the shareholder returns is 13.37% with a median of 5.17%. After the 5% winsorization process, the mean value reduces to 9.83% while leaving the median unchanged.

Boyle and Roberts (2013) report a mean stock return of 16.71% between 1997 and 2005 for NZ firms. This is slight higher than the statistics in my study before winsorization and this may be attributed to the negative average stock return in 2008 in my sample. Compared to NZ firms, US firms have higher stock returns. Grinstein and Valles (2008) document an average stock return of 19% for S&P 1500 firms in 2000 and Bhagat and Bolton (2008) find the average stock return was 17% between 1990 and 2004.

Table 5 Summary Statistics of Share Return

This table reports the summary statistics of share returns for the sample period. The data used to calculate the statistics are extracted from companies' annual reports. Share returns are calculated as the percentage change in adjusted share price between two points in time.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	71	31.50	11.47	106.29	812.50	-60.137
1998	78	-11.74	-14.82	38.12	150.26	-81.59
1999	75	44.72	26.73	124.85	1024.32	-68.62
2000	76	25.17	4.52	95.05	569.47	-74.36
2001	80	4.68	-2.82	57.00	240.00	-85.96
2002	77	8.92	6.66	43.01	229.55	-80.59
2003	80	14.28	11.13	43.52	180.38	-81.40
2004	78	27.73	20.71	58.58	296.16	-93.75
2005	75	11.81	9.90	35.81	110.00	-60.61
2006	82	6.91	4.20	29.96	82.94	-57.89
2007	79	19.02	15.77	47.12	233.00	-76.02
2008	76	-18.29	-22.65	39.91	171.43	-91.87
All Years	931	13.37	5.17	67.83	1024.32	-93.75
Jarque-Bera	2.6e+05					
Summary Statistics of Share Return for the Whole Sample after Winsorization						
All Years	931	9.83	5.17	42.31	127.65	-64.63
Jarque-Bera	82.69					

Chapter 5

Analysis of Determinants of CEO Board Membership

5.1 Development of Hypotheses

This section identifies two operating environments which may affect shareholder value maximization and managerial utility maximization discussed in Sections 3.1 and 3.2, thus CEO board membership decision. These two environments are opacity of firms' information environment and strength of firms' governance environment. Next, I develop testable hypotheses in these operating environments using the theoretical framework.

The opacity of information environment affects firms' CEO board membership decision. Opacity is defined as the lack of information that would enable directors and investors to observe the operations of the companies and managerial actions, which may affect firm value.[1]

When the corporate information environment is opaque, the board of directors suffers from greater information transfer costs in acquiring firm-specific information. From shareholders' perspective, having CEOs on the board may be an optimal response to the opaque information environment to compensate for such costs. Meanwhile, CEOs also have greater incentives and ability to sit on the board in such an environment. First, self-serving

[1]The definition of opacity is based on Jin and Myers (2006), who define opacity as "the lack of information that would enable investors to observe operating cash flow and income and determine firm value"(p281).

CEOs are in a better position to expropriate shareholders' interests, which increases their incentives. Second, since the CEO's information advantage may be more valuable to firms in a more opaque information environment, CEOs may be in a better position to bargain for a board seat. Hence, both parties have a greater willingness to have CEOs on the board in a more opaque information environment.

Hypothesis 1: Firms that operate in a more opaque information environment are associated with greater probability of CEO board membership, ceteris paribus.

CEO board participation is also affected by firms' governance environment.[2] The reasoning behind the shareholder value maximization argument is based on the recognition that individual governance provisions may substitute for one another in mitigating agency conflicts. Agrawal and Knoeber (1996) argue that because these alternatives exist, the use of one governance mechanism may depend on the use of the others, which means these mechanisms are interdependent. Hence, if other governance mechanisms are sufficient in imposing constraints on CEO actions, it may not be necessary to incur extra costs to separate the CEO from the board. Thus, from the shareholders' perspective, an otherwise stronger (weaker) governance environment may reduce (increase) the need to separate the CEO from the board, which leads to a higher (lower) probability of CEOs on the board.

In contrast, under the CEO utility maximization argument, the entrenched CEOs in a stronger (weaker) governance environment have less (greater) incentives to sit on the board due to the increased (decreased) scrutiny from other governance mechanisms. Hence, with the presence of a stronger (weaker) governance environment, they may refuse (attempt) to sit on the board.

Given the expected opposite consequences arising from the diverging interests between shareholders and the CEO, this hypothesis allows me to test whether the CEO

[2]It may be important to notice that firms have different abilities and preference to employ one governance mechanism against another. For example, a research-oriented consulting firm may be more likely to be served by inside directors on the board because of specific skills and knowledge required to monitor and advise. With this less independent board, other monitoring mechanisms are more important to perform its monitoring function, such as whether CEOs are involved on the board. Bathala and Rao (1995) state different firms have different abilities to utilize other alternative agency conflict minimizing devices, therefore, it is impossible to suggest an uniform employment of governance mechanisms.

board membership decision is truly determined by shareholder interests or CEO interests. Since these two forces expect different consequences, I offer no specific prediction about the direction of the impact on CEO board membership.

Hypothesis 2: CEO board membership decision is significantly affected by firms' governance environment.

The following table illustrates the relationships discussed by these two hypotheses:

Effects on the Probability of CEO being on the Board		
	Information Opacity	Governance Strength
Shareholder Value Maximization	Positive	Positive
Managerial Utility Maximization	Positive	Negative

Tests of these hypotheses require identification of characteristics that describe firms' information opacity and governance strength and their measurement. This task will be accomplished in the next section.

5.2 Measurement of Variables

5.2.1 Variables Describing Information Opacity

I proxy for the opacity of information environment by firm size, firm complexity and growth opportunities.

Firm Size

The opacity of firms' information environment can be affected by firm size. In large firms, the total amount of the information relevant for decision-making increases and the number of information bearers increases, so it is more difficult for CEOs to obtain all the necessary information. In other words, the amount of information CEOs possess in percentage terms is smaller in larger firms. For example, CEOs may be able to obtain 70% of the total information in large firms whereas CEOs in small firms are capable of obtaining 90% because almost all the company operation is under their supervision. With the lower

percentage of the total information CEOs possess, the information the board receives decreases in large firms. Hence, the information environment is more opaque in large firms. Following prior studies, such as Coles et al. (2008), Grinstein and Valles (2008), and Cahan and Wilkinson (1999), I use firms' annual sales and firms' market capitalizations to measure firm size.

Table 6 shows the summary statistics of annual sales between 1997 and 2008, and the figures are expressed in 1997 dollars. Inflation rates were obtained from the Reserve Bank of New Zealand.[3] This website publishes annual inflation rates for each quarter, which can be used for converting nominal sale figures to 1997 dollars for companies with different balance dates.[4]

Table 6 shows the means of real sales fluctuated between 1997 to 2001, decreased between 2002 and 2005, and then picked up from 2006. The mean sales dropped significantly in 1998 compared to those in 1997. A majority of this reduction may be attributable to the financial crisis in Asia, which had a negative impact on firms' revenues.[5][6] The mean sales increased significantly in 2001. This increase was partly attributable to a 117.7 percent increase in revenues by Air New Zealand following an inclusion of the contribution from Ansett Australia.

The summary statistics for firm sales in Table 6 show that there is a high degree of variability in the size of firms in the dataset. Firm sales range from as low as NZD0 to a maximum of NZD7,465.51 millions. The sale value of zero occurred in Certified Organics Ltd in 1998. The company did not generate any revenue in that year because its construction of Shanghai aquarium was still in process. Once operational, the aquarium would be the sole source of the Company's income. In the raw data, the company's sale

[3]See http://www.rbnz.govt.nz/keygraphs/fig1.html

[4]For example, nominal sale for Affco Holding in 1998 was $944,980,000 and the balance date is 30 September. According to the Reserve Bank of New Zealand, annual inflation for year ending September 1998 was 1.7%. To convert 1998 nominal sale to 1997 dollars, I divide $944,980,000 by 1.017. Similarly, the equivalent calculation for 1999 real sales is $836,915,000 (nominal sales in 1999) divided by 0.995(inflation for the year ending September 1999) and then divided by 1.017. If a balance date is not the end of a quarter, I adjust the inflation rate on pro-rata basis to get more accurate real sales figures.

[5]According to a report released by The Treasury, the Asian crisis has significantly affected NZ directly through reduction of exports and tourists

[6]See http://www.treasury.govt.nz/economy/overview/archive/pdfs/nzefo-99.pdf.

Table 6 Summary Statistics of Real Annual Sales

The table repots the mean, median, standard deviation, maximum and minimum values of annual sales in real 1997 dollars. The sample ranges from 1997 to 2008 with a full sample size of 972. The data are reported as 1997 values and in NZD millions.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	363.91	103.85	704.17	3,106.50	0.01
1998	81	300.08	86.85	597.99	3,354.39	0.00
1999	76	333.90	89.78	672.03	3,409.14	0.03
2000	81	343.38	76.89	736.02	4,206.39	0.02
2001	87	401.74	70.60	1,058.39	7,465.51	0.07
2002	82	385.55	71.38	874.44	5,051.51	0.02
2003	84	360.91	85.62	792.46	4,665.86	0.08
2004	82	356.91	85.47	808.14	4,722.40	0.04
2005	81	325.75	94.84	788.52	4,917.39	0.04
2006	85	337.61	87.30	732.85	4,306.22	0.04
2007	80	358.95	103.49	794.03	4,690.00	0.05
2008	81	387.79	113.24	850.01	5,396.16	0.05
All Years	972	355.08	87.41	7,91.00	7,465.51	0.00
Jarque-Bera	1.9e+04					
Summary Statistics of Annual Sales for the Whole Sample After Winsorization						
All Years	972	331.75	87.41	666.97	3,295.19	0.12
Jarque-Bera	7,016					

value is recorded as zero. However, because the construction project is a one-off event and is unlikely to repeat in the near future, the zero sale value may not be a fair representation of the company's firm size. In order to measure its firm size more accurately, its sale value is recorded as the average of the previous year's sale figure and the following year's sale figure in the subsequent analysis. The maximum sale value occurred in Air New Zealand in 2001. Overall, there is no particular trend in the medians. However, the medians being

significantly lower than the means suggest that some large sale values increase the average means. Mean sales for the full sample are NZD355.08 million. Median sales are NZD87.41 million.

The existence of the extreme values in the data is likely to have a large influence on the descriptive statistics, hence the descriptive statistics may fail to provide an accurate representation of NZ firm sales. I use a 5% winsorization approach to modify the extreme values. The summary statistics after the adjustment appear in the last two rows of Table 6, which show that the mean value of annual sales falls to NZD331.75 while leaving the median value unchanged. After the winsorization, the JB value has a significant reduction. Despite the significant reduction, it is still significantly larger than the critical value, indicating the sample is not normally distributed.

Market capitalization for each firm is calculated as the number of shares on issue multiplied by the share price at the balance date. Table 7 documents market capitalization expressed in 1997 million dollars between 1997 and 2008. Again, real market capitalization is calculated based on the inflation rates released on the Reserve Bank of New Zealand website.

Table 7 shows that the average market capitalization ranges from NZD 367.49 million to NZD561.49 million with the medians significantly lower than the means, suggesting that skewness is present in the sample. In fact, after the 5% winsorization, the average market capitalization for the sample period is NZD331.80 million dollars, which is lower than the average market capitalization before winsorization in any sample year.

Complexity of Firms

In this project, I follow prior studies to measure firm complexity using the number of operating segments (Prevost et al., 2002a, Fama and Jensen, 1983) and firm age (Boone et al., 2007, Linck et al., 2008).

Operating Segments

A firm's number of operating segments affects its information environment. A multi-segmental environment is associated with more agents possessing information relevant for decision-making. Since the information is transferred through more information bearers, it

Table 7 Summary Statistics of Market Capitalisation

This table reports summary statistics of market capitalization from 1997 to 2008. It is calculated as the number of shares on issue multiply share price at the balance date. The sample of firms is obtained from the NZX Company Research. The values are expressed in 1997 values and in NZD millions.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	468.57	89.53	1,556.18	12,000.00	2.61
1998	81	373.10	64.16	1,657.46	14,800.00	1.20
1999	76	463.64	65.66	1,826.74	15,600.00	2.20
2000	81	435.14	83.60	1,434.07	12,500.00	1.38
2001	87	367.49	65.00	1,111.35	9,640.46	1.95
2002	82	377.48	67.61	1,027.17	8,291.10	0.00
2003	84	407.97	75.07	1,087.26	8,830.56	0.11
2004	82	445.61	99.14	1,202.48	9,842.02	2.19
2005	81	419.75	103.51	1,178.32	9,876.82	0.41
2006	85	494.34	101.78	1,056.00	6,291.00	2.86
2007	80	561.49	90.11	1,188.69	7,218.81	4.19
2008	81	381.88	91.07	784.26	4,964.95	0.74
All Year	972	432.15	82.06	1,276.45	15,600	0.00
Jarque-Bera	1.7e+05					
Summary Statistics of Market Capitalization after Winsorization						
All Years	972	331.80	82.06	606.70	2,782.34	3.30
Jarque-Bera	3,171					

is more difficult for CEOs in firms with multiple segments to gather all useful information than CEOs in firms with a single segment. Hence, CEOs in multi-segmental firms are likely to obtain relatively less information for decision-making than CEOs in single-segmental firms. When it is more difficult to obtain the information relevant for decision-making, the information environment is more opaque to the board of directors.

The New Zealand equivalents to International Financial Reporting Standards or the NZ IFRS requires "identification of operating segments on the basis of internal reports that are regularly reviewed by the entity chief operating decision maker in order to allocate resources to the segment and assess its performance". NZ International Accounting Standards or NZ IAS 14 requires identification of two sets of segments - one based on related products and services and the other based on geographical areas. In NZ, "segment reporting" section of companies' annual reports provides information on the number of business segments and the number of geographic segments.

The "Segment Reporting" section of companies' annual reports usually classifies the number of operating units by the number of primary business lines or activities they expect their revenue is derived from and the number of geographic units by the number of countries they operate in. Tables 8 and 9 show the summary statistics of the number of business units and geographical segments from 1997 to 2008.

From Tables 8 and 9, most of the sample firms have one business unit and one geographic unit. The average number of business units is 1.75 while the number of geographic segments is 1.6. From the JB values, neither of the datasets is normally distributed.

Other NZ-focused papers report similar statistics for the number of business segments. For example, Prevost et al. (2002b) document that the mean of the number of business segments for the period between 1991 and 1997 was 1.959. Compared to NZ firms, US firms are found to have more business segments. Balsam and Upadhyay (2009) record that on average, US firms have 2.5 operating segments with a median value of 2 and Coles et al. (2008) find the mean business segment between 1992 and 2001 was 2.6 and the median was 2.[7]

Firm Age

Firm age, as another measure of firm complexity, has received much less attention in the literature. Following Boone et al. (2007) and Linck et al. (2008), I include firm age as another measure of complexity in the analysis. The argument is that older firms are more complex than young firms, thus the board in older firms face more opaque information

[7]They did not define operating segments in their paper. I assume they refer to the number of business segments.

Table 8 Summary Statistics of Number of Business Units

This table reports the mean, median, standard deviation, maximum and minimum values of the number of business units from 1997 to 2008 with a full sample size of 972. The number of business units is defined as the number of primary business lines the firms expect their revenues are derived from.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	1.85	1.00	1.34	7	1
1998	81	1.74	1.00	1.20	6	1
1999	76	1.87	1.00	1.26	6	1
2000	81	1.69	1.00	1.22	7	1
2001	87	1.72	1.00	1.30	7	1
2002	82	1.84	1.00	1.40	8	1
2003	84	1.83	1.00	1.36	8	1
2004	82	1.80	1.00	1.28	8	1
2005	81	1.71	1.00	1.19	8	1
2006	85	1.62	1.00	1.15	8	1
2007	80	1.68	1.00	1.20	8	1
2008	81	1.65	1.00	1.20	8	1
All Years	972	1.75	1.00	1.26	8	1
Jarque-Bera	2,085					

environment than younger firms. In addition, Boone et al. (2007) and Linck et al. (2008) argue that firm age is non-linearly related to firm complexity. Hence, I also include the square term of firm age in the estimation analysis.

Firm age is measured by the number of years since the firm was first listed on the NZX stock exchange and the data is obtained from the NZX Company Research.

Table 10 presents the descriptive statistics of firm age. It shows that between 1997 and 2008, the average listing age was steady, ranging between 13.94 and 15.98 and the medians were also relatively stable, ranging between 9 years and 12.5 years. Overall, NZ

Table 9 Summary Statistics of Number of Geographical Units

This table reports the summary statistics of the number of the geographical units from 1997 to 2008 with a full sample size of 972. The number of geographic segments is defined as the umber of countries the firms operate in.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	1.49	1.00	0.91	5	1
1998	81	1.52	1.00	0.84	5	1
1999	76	1.63	1.00	1.02	6	1
2000	81	1.55	1.00	0.81	5	1
2001	87	1.60	1.00	0.83	5	1
2002	82	1.65	1.00	0.97	6	1
2003	84	1.60	1.00	0.87	5	1
2004	82	1.67	1.00	0.96	5	1
2005	81	1.73	1.00	0.99	5	1
2006	85	1.65	1.00	0.93	5	1
2007	80	1.68	1.00	0.86	5	1
2008	81	1.58	1.00	0.91	5	1
All Years	972	1.60	1.00	0.91	6	1
Jarque-Bera	965.41					

firms have an average listing age of approximately 15 years.

Comparison of firm age with other countries is not applicable because other counties may use different proxies to measure firm age, which are not available in NZ. For example, Linck et al. (2008) use the number of years since the firm first appeared on CRSP.[8]

Growth Opportunities

[8]The Center for Research in Security Prices, also known as CRSP, is a provider of historical stock market data. The Center is a part of the Booth School of Business at the University of Chicago. As of 2006, CRSP claims almost 500 clients. It is one of the major databases for academic researchers and investment professionals specializing stock market research.

Table 10 Summary Statistics of Firm Age

This table reports the summary statistics of firm age since listing on the NZX from 1997 to 2008. The firm age statistics are from the NZX Company Research.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	60	14.95	11	15.59	93	1
1998	66	13.94	11	14.83	94	0.5
1999	68	15.66	12.5	15.08	95	1
2000	75	14.13	9	14.84	96	1
2001	83	14.36	9	14.72	97	0.5
2002	81	13.93	9	15.33	98	0.5
2003	83	14.74	10	15.26	99	0.5
2004	81	14.79	10	15.62	100	1
2005	80	15.17	11	15.58	101	1
2006	85	14.16	10	15.47	102	1
2007	78	15.72	11	16.10	103	1
2008	80	15.98	11.5	16.11	104	1
All Years	920	14.79	10	15.31	104	0.5
Jarque-Bera	5,150.78					

Growth opportunities also affect the opacity of firms' information environment. Compared to firms with less growth opportunities, growing firms have more project development opportunities, hence greater information transfer needs (even if the growth is an expansion of existing business line(s), information transfer needs are still greater than in firms with less growth opportunities). Moreover, firms with more growth opportunities require fast and frequent decision-making because information updates more rapidly and the consequence of lost opportunities due to delayed decisions is more severe in a growing firm. As an information bearer, the CEO is the only person in the company who is very knowledgeable about the projects and therefore the only candidate who can pass the information to other board members in a timely and accurate manner. The more growth opportunities the firms

have, the more asymmetric the information between the CEO and the board of directors. Given the information asymmetry, the information environment is more opaque to the board of directors in growing firms.

Some prior studies use R&D investment to sales (Grinstein and Valles, 2008) and R&D investment to assets (Coles et al., 2008, Balsam and Upadhyay, 2009) as proxies for growth opportunities. Because of the unavailability of such data for NZ firms, Tobin's Q ratio is used as the proxy.

Lindenberg and Ross (1981) and Grinstein and Valles (2008) define Tobin's Q ratio as the ratio of the firm market value to the replacement costs of its assets. Demsetz and Villalonga (2001) argue that Tobin's Q ratio is typically estimated as:

$$\text{Tobin's Q Ratio} = \frac{\text{Market Capitalization + Long-Term Debt+ (Current Assets - Short-Term Debt)}}{\text{Total Assets}} \tag{5.1}$$

where market capitalization is the product of a firm's stock price and the number of common stock outstanding; long-term debt is the book value of long term liabilities; short-term debt is the book value of current liabilities and current assets is the book value of current assets. Table 11 presents the summary statistics of Tobin's Q ratios from 1997 to 2008.

Table 11 shows that the average mean values of the Q ratios have increased steadily between 1998 and 2005 except a big fall in 2001. The medians, on the other hand, followed a gradual increasing trend between 1998 and 2002 and 2003 and 2006. The mean value was significantly higher in 2006 than in any other year. The maximum value of 335.40 in 2006 is due to the fact that Training Solutions' Limited market capitalization was relatively large compared to other inputs that are used to calculate Tobin's Q ratio, in particular, total assets, resulting in a large Tobin's Q ratio. The minimum value occurred in 2001 with Northland Port Corporation due to a high short-term debt level. In order to get a more accurate presentation of Tobin's Q ratio for the entire sample, these outliers are winsorized at the 5% level. The summary statistics after winsorization are reported at the bottom of Table 11.

Other NZ studies report slightly lower values for Tobin's Q ratio. For instance, Prevost et al. (2002b) and Hossain et al. (2001) document mean ratios of 1.12 and 1.15, respectively, for the years between 1991 and 1997. On the other hand, US-orientated studies

Table 11 Summary Statistics of Tobin's Q Ratio

This table reports the summary statistics of Tobin's Q ratio from 1997 to 2008. The sample data is obtained from the NZX Company Research. This ratio is calculated using the following formula:

$$\text{Tobin's Q Ratio} = \frac{\text{Market Capitalization + Long-Term Debt+ (Current Assets - Short-Term Debt)}}{\text{Total Assets}} \quad (5.2)$$

where market capitalization is number of shares on issue times share price at balance date; long-term debt and short-term debt are the book value of long-term liabilities and the book value of short-term liability; and current assets is the book value of current assets.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	71	1.40	1.20	0.87	5.33	-0.60
1998	80	1.21	0.96	0.98	6.02	-0.78
1999	76	1.31	1.02	1.13	7.87	-0.80
2000	81	1.66	1.07	2.08	11.72	-0.51
2001	84	0.76	1.19	8.73	13.84	-76.38
2002	78	1.69	1.24	1.69	11.54	0.05
2003	79	1.72	1.12	2.54	21.53	0.12
2004	81	1.80	1.36	1.78	13.40	0.19
2005	78	2.24	1.42	3.26	25.34	0.04
2006	85	6.16	1.44	36.33	335.40	0.16
2007	80	2.22	1.32	2.97	18.76	0.23
2008	81	1.36	1.14	1.08	7.31	-0.05
All Years	954	1.98	1.22	11.32	335.40	-76.38
Jarque-Bera	2.5e+07					
Summary Statistics of Tobin's Q Ratio after Winsorization						
All Years	954	1.60	1.22	1.39	7.32	0.16
Jarque-Bera	3,378					

report higher values for Tobin's Q ratio. Coles et al. (2008) report that between 1991 and 2001, the mean and median values of Tobin's Q ratio were 1.79 and 1.41, respectively; Grinstein and Valles (2008) document that the mean and median value of the Q ratio were 2.2 and 1.5, respectively in 2000; Balsam and Upadhyay (2009) report the corresponding values were 2.146 and 1.684, respectively, between 1996 and 2005.

5.2.2 Variables Describing Governance Strength

Board Size

Board size has been considered to affect firms' governance environment by affecting the level of monitoring. The topic of board size has been studied extensively and the general consensus is that smaller boards are more effective at monitoring. First, there are high co-ordination costs associate with large boards. Conger and Lawler (2009) point out that the board as a whole simply does not spend much time together. Usually, directors have a full time job elsewhere and they meet six to ten times a year with gaps of weeks between meetings. There are high co-ordination costs for them to work together and the costs are even higher with larger board size. Second, larger boards are likely to lead to less effective group discussions and the dilution of decision-making power results in decisions dominated by CEOs. Jensen (1993) suggests that the board provides better monitoring of the management with a smaller size because large boards are "less likely to function effectively and are easier for the CEO to control". Lipton and Lorsch (1992) argue that directors rarely publicly criticize the policy and the behavior of the top manager and this problem is more prominent with the increase in board size. Ryan et al. (2009) find board meeting frequency, which is a proxy for the level of board monitoring, declines with the size of the board. Smaller boards, on the other hands, are more cohesive, more productive and therefore more effective at monitoring. Although the pool of expertise may increase with board size, the results from prior NZ governance studies indicate a larger board reflects ineffective monitoring in NZ. For example, Hossain et al. (2001) find board size is negatively related to Tobin Q ratio; Ahmed et al. (2006) find board size is negatively associated with earnings informativeness, suggesting that a smaller board is more effective than a larger board in monitoring the quality of earnings. Given the evidence that has

shown the negative effects of a large board size, I argue that a smaller board represents a stronger governance environment.

Board size is measured by the total number of directors on the board, including both non-executive, executive directors and the CEO (if also a director). Table 12 provides the summary statistics for board size.

Table 12 Summary Statistics of Board Size

This table reports the summary statistics of board size from 1997 to 2008 with a sample size of 972. The sample of firms is obtained from the NZX Company Research. The data was obtained from companies' annual reports.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	6.57	6.00	1.86	13	3
1998	81	6.42	6.00	1.87	12	3
1999	76	6.38	6.00	1.75	11	3
2000	81	6.21	6.00	1.88	11	3
2001	87	6.19	6.00	1.87	10	3
2002	82	6.21	6.00	1.98	14	3
2003	84	5.97	6.00	1.78	11	3
2004	82	6.17	6.00	1.64	10	3
2005	81	6.08	6.00	1.63	11	3
2006	85	5.99	6.00	1.55	11	3
2007	80	5.90	6.00	1.73	12	3
2008	81	5.91	6.00	1.45	11	3
All Years	972	6.14	6.00	1.78	14	3
Jarque-Bera	66.95					

Table 12 shows that the average board size over the sample period is approximately 6 directors. Moreover, it has been steadily decreasing from 6.57 in 1997 to 5.91 in 2008 while the medians remain constant over the sample period. The minimum board size of 3 is consistent with the NZX requirement that there shall be a minimum of three directors

for an issuer. The statistics for board size are similar to other NZ studies. For example, Boyle and Ji (2013) show the average board size decreased from 6.7 directors in 1995 to 5.9 in 2010. Bathula (2008) reports a slightly lower average board size of 5.81 between 2004 and 2007. Using the top 50 publicly-listed companies on the NZX for the period 2000 through 2007, Reddy et al. (2010) document a higher board size of 6.98.

The board size of the US firms appears to be much larger. Reportedly, the average board size in the US was 9.27 between 1999 and 2003 (Chen et al., 2008), 7.5 between 1990 and 2004 (Linck et al., 2008) and 9.25 between 1998 and 2007 (Bhagat and Bolton, 2009). The board size in NZ being much smaller than that in the US may be reflective of the smaller size of NZ firms. Moreover, Chhaochharia and Grinstein (2007) also find that US average board size decreased between 1997 and 2003 and the decrease was statistically significant in large firms.

Proportion of Independent Directors

The proportion of independent directors on the board affects the level of monitoring and functions as a governance mechanism. Fama and Jensen (1983) argue that outside directors, who are less affiliated with the management, are effective in monitoring the behavior of managers and protecting shareholders' interest. Since they have fewer reasons to collude with the management, these outside directors have greater incentives to carry out effective monitoring, which helps to signal their competence to other potential employers. For example, Bhagat and Bolton (2008) and Hermalin and Weisbach (1998) find more board independence is positively correlated with the probability of disciplinary CEO turnover, providing evidence of monitoring by independent directors; Ryan et al. (2009) find evidence that monitoring, proxied by board meeting frequency, increases as the board has a greater proportion of independent directors; Wright et al. (2002) find post-acquisition CEO compensation changes were based on performance when the board was more independent, while post-acquisition CEO compensation changes were based on firm size when the board was composed of fewer outside directors, providing evidence that the level of monitoring is affected by board independence. All this evidence suggests that the governance environment is stronger when the board of directors is more independent.

In NZ, there was no mandatory ratio of independent directors on the board by law

until the release of the new NZX listing rules incorporating the proposed requirement regarding board independence in the NZX Code in 2003. Before then, the level of independence for board members was determined in accordance with the constitution of the company. Since 2003, the NZX Code requires a minimum of two independent directors, or one-third of the total board members (to be rounded to the nearest number), whichever is greater. However, the NZX Code and the NZX listing rules do not provide a definition of an independent director. By convention, an independent director is defined as one who is not an executive of the firm and who has no disqualifying relationship. In practice, it is generally interpreted to mean that an independent director owns less than 5% of the firm's shares and receives less than 10% of his annual income from the firm (Boyle and Ji, 2013). However, because the data of director total income for each fiscal year is unobtainable, directors' shareholding becomes the sole threshold for identification of independent directors in years before the NZX listing rules required firms to list independent directors in their annual reports. The number of identified independent directors is then used to calculate the proportion of independent directors on the board. The proportion of independent directors is calculated as the number of independent directors over the total number of directors on the board, multiplied by 100. Table 13 shows the descriptive statistics of the proportion of independent directors on NZ boards.

Table 13 shows the means of the proportion of independent directors have little variation ranging between 57.58% and 61.56% over the 12 year period. If anything, there seems to be an increasing trend in the proportion of independent directors on the board. Consistent with the pattern presented in my sample, Prevost et al. (2002b) and Hossain et al. (2001) calculated the average proportion of independent directors as 55.7% and 56.6%, respectively, between 1991 and 1997. Boyle and Ji (2013) report a mean of 55% in 1995 and 63% in 2010.

Compared to NZ firms, US firms have a higher proportion of independent directors on the board. For instance, Coles et al. (2008) report that the percentage of outside directors on the board was 78% between 1992 and 2001; Chhaochharia and Grinstein (2007) find 71.4% of directors on the US boards were independent in 2003; Bhagat and Bolton (2009) document a figure of 61% between 1998 and 2002 and 72% between 2003 and 2007.

Table 13 Summary Statistics of Proportion of Independent Directors on the Board

This table reports the summary statistics of proportion of independent directors on the board from 1997 to 2008. The sample firms are extracted from the NZX Company Research. The values are reported in percentages (%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	71	57.58	57.14	24.58	100	0
1998	80	59.23	60.00	25.13	100	16.67
1999	75	59.02	60.00	24.41	100	14.29
2000	80	61.04	60.00	23.26	100	14.29
2001	86	60.64	62.50	23.08	100	14.29
2002	82	61.56	60.00	23.43	100	14.29
2003	84	60.28	60.00	23.50	100	0
2004	80	58.87	58.57	21.66	100	20.00
2005	79	58.19	55.56	22.30	100	16.67
2006	84	58.98	53.57	20.00	100	27.27
2007	79	61.09	57.14	20.94	100	28.57
2008	80	60.94	60.00	21.19	100	27.27
All Years	960	59.82	60.00	22.71	100	0
Jarque- Bera	30.85					

Multiple Directorships

The number of other directorships held by firms' directors may also affect firms' governance environment. This variable has two competing interpretations. On the one hand, Fama and Jensen (1983) propose a quality hypothesis, which refers to the signal of director quality possessed by directors with multiple appointments. Specifically, they find a positive market reaction for appointing directors having multiple board appointments as they signal the directors being more experienced, more capable to offer advice, and to provide better monitoring. Similarly, Ferris et al. (2003) propose a reputation effect and they find that past performance of firms for which an individual serves as a director correlates with the number

of directorships subsequently held by that individual. Gilson (1990) and Vafeas (1999) suggest that the number of directorships held by a director might proxy for reputation capital, which indicates that these directors can be viewed as high quality directors. Cahan et al. (2005) define busy directors as those with 3 or more directorships. They find that there is a positive association between director quality and director busyness, suggesting busier directors are perceived as more capable. In addition, directors with multiple board appointments may possess diverse experience. Such directors on the board are more capable of managing potential agency costs brought by CEOs on the board and thus act as one of the alternative monitoring mechanisms, which helps to strengthen firms' governance environment.

On the other hand, Ferris et al. (2003) also propose a busyness hypothesis, which postulates that serving on multiple boards over-commits an individual and thus limits directors' ability to provide sufficient and effective monitoring. Due to the time and energy constraints, these busy (that is, distracted) directors may simply "hand the reins" to CEOs, who work full-time in the company and are considerably more informed about challenges and opportunities faced by the firms, and allow CEOs to manage the firms in their own way. From this perspective, busy boards represent a weaker governance environment.

Multiple directorship is measured by the total number of additional directorships held by firms' directors. The extra directorships held by each director are identified from firms' annual reports, which report directorships both in listed and private companies. For the companies that do disclose this information in their annual reports, I directly record the number of current directorships. For those annual reports that do not reveal this information, the NZ Companies Office website is used as the alternative to search for information by director name.[9] The screening process in the NZ Companies Office website is as follows: enter a name of a director under the "director search" and allow the website to show both the current and historical directorships in current and struck-off companies. The returned results provide all the directorships the director is holding or had held up-to-the-minute. The results provide the date the director began to hold a board seat in a company and the date the director ceased to hold the position in that particular company. Note, the website only shows the resigned date if the company still exists. For companies

[9]See http://www.business.govt.nz/companies

that are struck-off, there is no resignation date. In this case, I check if the company still exists for the year I am investigating. This information can also be found within this website. The company still exists if it is recorded as "registered" and otherwise it is shown as "struck off". If the company still exists, I count it as one additional directorship and if the company was struck off, it is not recorded in my sample. Following this procedure, I collect information on directors' other board memberships. Since the website provides directors' directorships on an individual basis, it is a very time-consuming process.

I use two measures of multiple directorships: one is multiple directorships in listed companies and one is multiple directorships in independent companies. Multiple directorships in listed companies refers to the situation when a director holds a directorship in a NZ publicly listed company and multiple directorships in independent companies refers to the situation when a director holds a board seat in a company that is not a subsidiary or associated company of the target company that is listed in the company's annual reports. Table 14 and 15 present the summary statistics of multiple directorships in independent companies and listed companies, respectively.

Table 14 shows that for an average NZ firm, its directors hold about 40 independent board memberships. The reason for the large number of board seats a company's directors hold may be that some directors hold a number of directorships in small unlisted companies. The fact that NZ firms being relatively small, which makes them easier to monitor and advise, allows directors to serve on multiple boards. There is a large variation between the maximum value and the minimum value. The maximum across the whole period is 252 additional directorships and the lowest value is 0. To modify the outliers in the sample, a 5% winsorization process is carried out. After winsorization, despite there being little change in the mean and no change in the median, the JB value decreases significantly, suggesting the modification has made the sample closer to a normal distribution.

Table 15 shows that the means of the number of board seats in additional listed companies range between 1.89 and 2.96 with a median of 2. In addition, it also shows that outside board appointments in listed companies held by a typical NZ board increased gradually between 1997 and 2003 and then they decreased in the following years.

NZ directors appear to hold a smaller number of directorships in the listed companies

Table 14 Summary Statistics of Multiple Directorships in Independent Companies (excluding the CEO)

This table reports the summary statistics of director board memberships in independent companies from 1997 to 2008 with a sample size of 972. The number of directorships in independent companies is calculated as total number of outside directorships less the companies' subsidiaries and other relevant companies. Some annual reports disclose directors' other board seats and list the names of subsidiaries. For these companies, I subtract the number of subsidiary companies a director serves from the total number of other board seats a director holds. For companies that do not disclose directors' board membership, the NZ Companies Office website is used as a tool to search for information by director name. Firstly, I record the names of directors of a company, and then enter the names in the NZCO website. NZCO website provides a director's current and historical directorship in all companies. Using this method, I count the number of directorships each director holds in a given year and add up the number of other directorships held by all directors. From the directorships listed in the NZCO website, I identify the subsidiary companies and subtract these companies from the total number of directorships.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	33.07	23.00	38.98	240	1
1998	81	35.49	27.00	41.08	239	0
1999	76	41.45	29.50	41.55	200	0
2000	81	44.10	31.00	43.20	200	1
2001	87	39.17	28.00	39.20	184	0
2002	82	42.60	28.00	43.33	196	0
2003	84	44.15	31.50	40.85	193	0
2004	82	45.29	33.00	44.45	252	0
2005	81	46.17	35.00	44.10	231	0
2006	85	39.69	31.00	37.70	218	0
2007	80	38.10	29.50	37.38	218	0
2008	81	36.20	28.00	31.83	215	0
All Years	972	40.57	29.00	40.42	252	0
Jarque- Bera	2436					
Multiple Directorships in Independent Companies after Winsorization						
All Years	972	39.61	29.00	36.60	164	1.00
Jarque- Bera	961.50					

Table 15 Summary Statistics of Multiple Directorships in Listed Companies

This table reports the summary statistics of directors' board memberships in the listed companies from 1997 to 2008 with a sample size of 972. Similar to directors' board memberships in independent companies, I search a director's current directorships from the New Zealand Companies Office website, from which I identify the listed companies. Using this method, I collect the number of directorships each director holds in the listed companies in a given year and then add up directorships in the listed companies for all the directors.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	1.89	1.00	2.35	10.00	1.00
1998	81	2.10	1.00	2.35	9.00	0
1999	76	2.04	1.00	2.40	11.00	0
2000	81	2.52	2.00	3.06	17.00	0
2001	87	2.44	2.00	2.60	11.00	0
2002	82	2.96	2.00	2.95	11.00	0
2003	84	2.96	2.00	2.74	11.00	0
2004	82	2.67	2.00	2.51	9.00	0
2005	81	2.86	2.00	2.80	12.00	0
2006	85	2.80	2.00	2.69	12.00	0
2007	80	2.44	2.00	2.18	9.00	0
2008	81	2.21	2.00	2.13	10.00	0
All Years	972	2.51	2.00	2.59	17.00	0
Jarque-Bera	354.68					

compared to their US counterparts.[10] For example, Chhaochharia and Grinstein (2007) and Ferris et al. (2003) report the number of board seats in additional listed companies on an individual basis and find that each typical US director holds fewer than two direc-

[10]Although not specified explicitly, US-oriented studies seem to refer to director board seats in listed firms only.

torships; Grinstein and Valles (2008) document that an average US director hold 1 board seat in other listed companies, with a median of 0.8.

Board Ownership

Board ownership affects firms' governance environment because it provides shareholder-like incentives. As directors' shareholding increases, directors are more likely to monitor the actions of CEOs for their own personal benefit. These directors, as subsequent bearers of CEOs' behavior, are likely to impose greater scrutiny and try to influence other board members to make interest-alignment decisions. Raheja (2005) argues outside board members, who have high ownership of shareholding, have incentives to monitor CEOs. These outside directors, as interested parties of CEOs' actions, will try to exert influence on other board members to make managers align their incentives to the owners'. Bhagat and Bolton (2008, 2009) show that directors' shareholding is positively related to both future operating performance and to the probability of disciplinary management turnover in poorly performing firms. In addition, directors' shareholding is sometimes used as proxy for directors' abilities and experience because more capable directors are likely to accumulate company shares over time (Grinstein and Valles, 2008). More experienced directors may be more capable of managing potential agency costs, representing a stronger governance environment.

Board ownership is defined as the sum of all directors' shareholding in a company and is calculated by the total percentage of company shares the board of directors (exclude the CEO if he is on the board) holds, including beneficial and associated person interest. This information is obtained from companies' annual reports. Table 16 shows the summary statistics of board ownership.

Table 16 shows that average board ownership measured by the sum of beneficial and associated person shareholding ranged between 13.05% and 25.15% while the median ranged between 3.36% and 12.09%. Overall, the average board ownership had a decreasing trend over the sample period. The medians have dropped significantly since 2000. There is a large variation in the board's ownership: in 1997, the maximum value reached 98.44% and the minimum value hit 0% in every sample year. Because of the high degree of volatility, this variable is winsorized at 5% level. The bottom two rows of Table 16 report

Table 16 Summary Statistics of Board Ownership (excluding the CEO)

This table reports the summary statistics summary statistics of board ownership from 1997 to 2008 with a sample size of 972. Directors' shareholding includes shares held beneficially and shares held by associated persons. The sample of firms is obtained from the NZX Company Research. Shareholding data was obtained from companies' annual reports. The values are reported in percentages (%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	24.03	12.09	27.58	98.44	0
1998	81	23.05	9.71	25.95	82.36	0
1999	76	25.15	10.81	28.39	96.65	0
2000	81	20.43	4.29	25.31	82.25	0
2001	87	19.10	5.43	23.37	82.25	0
2002	82	16.44	5.56	21.12	77.02	0
2003	84	14.60	3.36	20.56	76.97	0
2004	82	13.08	3.11	18.86	66.98	0
2005	81	13.55	3.20	19.85	87.67	0
2006	85	16.03	3.91	22.51	85.17	0
2007	80	13.42	3.33	20.26	75.94	0
2008	81	13.05	3.44	19.51	76.20	0
All Years	972	17.55	4.63	23.17	98.44	0
Jarque-Bera	272.39					
Summary Statistics of Board Ownership after Winsorization						
All Years	972	17.38	4.63	22.67	75.37	0
Jarque-Bera	168.93					

the descriptive statistics after winsorization.

Comparing to other NZ studies, Cahan and Wilkinson (1999) find that directors' shareholding (which they split into outside directors' shareholding and inside directors' shareholding) was 31.4% in 1992 and 27.9% in 1995. Hewa Wellalage and Locke (2012)

document director ownership of 16.8% for 40 firms listed on the NZX50 Stock Exchange between 2003 and 2010. Director shareholding in NZ appears to be significantly higher than in the US. According to Grinstein and Valles (2008), directors' shareholding (excluding the CEO) was 5.8% in 2000 with a median of 0. This seems to be consistent with the more dispersed ownership structure in the US.

Concentration of Shareholding

Block shareholding is an alternative monitoring device to control agency costs. As argued by Shleifer and Vishny (1986), Admati et al. (1994), and Zahra and Pearce (1989), dispersed ownership causes shareholders lack of sufficient incentives to monitor CEO actions because all shareholders benefit from such monitoring activities even though some of them do not bear the cost.

Despite the free rider problem, blockholding investors may find it worthwhile to monitor CEOs because they have a large financial interest in the companies they invest in. Gillan and Starks (2000) find corporate governance issues raise concerns for all shareholders, but more so among institutional investors, who usually have a large shareholding in the companies. They document that institutional investors' submission of shareholder proposals regarding to prohibition of CEO duality increased from 0 (out of total submission of 1) in 1989 to 17 (out of total submission of 22) in 1994. Ryan et al. (2009) find the board's monitoring (proxied by board meeting frequency) is positively related to block ownership. Because block shareholders have more incentives to provide better monitoring themselves, greater block shareholding represents a stronger governance environment.

The Securities Markets Act 1988 states "A person has a substantial holding in a public issuer for the purposes of this Act if that person has a relevant interest in listed voting securities that comprise 5% or more of a class of listed voting securities of the public issuer". Hence, the block shareholding variable is measured by a shareholding of 5% or more of a company's stock.[11] The data is obtained in the "substantial shareholding" section of the companies' annual reports. Table 17 shows the summary statistics of block shareholding from 1997 to 2008.

Table 17 shows that an average firm's block shareholders hold 52.53% of company

[11]Note that custodial shareholding is not included in block shareholding although it may exceed the threshold of 5%. Custodial shareholding is comprised of numerous block and institutional shareholders who may be much smaller holders but their interest in the firm is listed through the custodial holding only, that is, there will be "nominee accounts", which are made up of shareholdings that are not often separately disclosed. These nominee accounts have no voting rights and thus cannot exert monitoring on the firm or its management. In fact, the annual reports of NZ firms do not include custodial shareholding interests in the "substantial security holders" section despite of their 5% or more of the company shareholding interests.

Table 17 Summary Statistics of Block Shareholding

This table reports the summary statistics of companies' block shareholding from 1997 to 2008. It is measured by the percent of firms' shares held by shareholders who hold more than 5% of the company shares. The sample of firms is obtained from the NZX Company Research. The values are reported in percentages(%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	68	59.98	60.56	17.44	89.81	24.33
1998	77	59.31	59.08	18.70	94.26	15.89
1999	73	57.11	58.43	19.13	91.48	13.1
2000	79	55.12	54.70	21.83	93.01	0
2001	82	54.35	55.76	20.82	97.81	0
2002	80	51.73	51.76	23.29	97.81	0
2003	81	50.61	53.69	24.72	97.81	0
2004	81	47.13	50.24	24.14	97.35	0
2005	78	46.85	49.24	24.87	94.72	0
2006	85	49.41	50.76	25.62	94.58	0
2007	80	49.09	50.9	25.87	94.44	0
2008	81	51.58	52.23	24.44	90.99	5.82
All Year	945	52.53	54.7	23.11	97.81	0
Jarque-Bera	39.81					
Summary Statistics of Block Shareholdings after Winsorization						
All Years	945	52.53	43.7	22.78	89.53	6.47
Jarque-Bera	46.73					

shares betwen 1997 and 2008. The means of the concentration in shareholding have fallen steadily between 1997 and 2005, and then increased slightly after that. The medians followed a similar trend to the means. After winsorization, the mean for the full sample remains the same, indicating that this variable is not affected by the extreme values.

My statistics are close to Prevost et al. (2002b)'s documentation that a 59.9% of

shares are held by shareholders holding at least 5% of the firms' equity in NZ. Compared to NZ firms, the block ownership is lower in the US. Linck et al. (2008) find block shareholders hold about 40% of company shares and Chen et al. (2008) find a block ownership of 34.4% in the US firms. The statistics show that US firms are characterized with more dispersed shareholders while NZ shareholding is relatively more concentrated.

5.2.3 Control Variables

Debt Ratio

Outside debt is used as a control variable because it can be used as a monitoring mechanism. As creditors are concerned about the company's ability to make interest payments and principle repayment, they are concerned about the company' profitability and have an incentive to monitor managerial discretion over free cash flows. Unlike dividend payments to shareholders, a failure to make promised interests and principle payments to creditors can lead firms to bankruptcy and CEOs redundant. Hence, the existence of outside debt may place an effective constraint on CEOs' behavior.

A number of studies have documented outside debt as a substitutable monitoring mechanism of the board (eg, Jensen, 1986, Agrawal and Knoeber, 1996, Grinstein and Valles, 2008, Prevost et al., 2002a). Jensen (1986) suggests the monitoring by outside debt plays an effective motivating force to improve organizational efficiency. When debt financing is available to a firm, the agency costs of CEO board membership decrease, which leads to a higher probability of CEOs sitting on the board.

The debt ratio is calculated as the ratio of total liabilities over total assets. A debt ratio greater than 1 indicates that a company has more debt than assets. My sample has debt ratios greater than 1 and this is due to unusual activities during those year. For example, because of re-structuring and assets disposition programme, the debt ratio of Media Technology reached 13.86 in 2003. Since this is an event unlikely to occur in the near future, this data should be modified as if the company is operating under normal conditions. The treatment for these values is to take the average of the debt ratio the year before and the year after. For instance, the debt ratio of of Media Technology in 2003 is

replace by the average of debt ratios in 2002 and 2004. However, for the ratios greater than one for more than 1 year, the original figures are kept because this may suggest there are matters within the firm that are unlikely to resolve in the short term and it is not unusual. After modifying these extreme outliers, a 5% winsorization process is carried out. Table 18 presents the descriptive statistics for the whole sample.

Table 18 Summary Statistics of Debt Ratios

This table reports the summary statistics of companies' debt ratio from 1997 to 2008. It is calculated as total debt over total assets. The sample of firms is obtained from the NZX Company Research. The values are expressed in percentages(%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	42.83	44.38	18.68	90.42	1.30
1998	81	45.01	46.36	18.86	86.83	1.13
1999	76	44.10	44.42	20.30	90.53	1.12
2000	81	46.19	45.85	21.51	98.09	1.81
2001	87	44.99	41.92	24.05	120.2	0.48
2002	82	43.99	38.97	33.40	273.41	3.95
2003	84	55.87	42.76	148.59	1386	0.84
2004	82	40.83	41.82	23.81	98.82	0.68
2005	81	41.34	38.40	24.03	95.71	2.74
2006	85	45.79	39.59	32.10	256.36	1.37
2007	80	45.81	41.43	24.18	140.09	1.15
2008	81	47.21	48.90	21.42	92.05	0.39
All Year	972	45.00	43.25	24.22	1386	0.39
Jarque-Bera	7,666					
Summary Statistics of Debt Ratio after Winsorization						
All Years	972	43.51	43.25	21.66	89.64	3.08
Jarque-Bera	1,993					

From Table 18, the average debt ratio is relatively constant over the years except

2003. The average debt ratio in 2003 was pulled up by the maximum value of 1,386%. Using the modification method mentioned above, the average becomes 39.95% in 2003. Overall, the summary statistics present a general decreasing trend for the years before 2003 and an increasing trend after 2003. The medians do not exhibit a particular trend but are quite close to the means. The winsorization process significantly reduces the JB statistic from 7,666 to 1,993.

Reddy et al. (2010) report similar statistics with a mean of 47% and a median of 44% between 1999 and 2007 for NZ large publicly-listed companies and Jiang et al. (2009) document that the average debt ratio was 39% between 2001 and 2005. Compared to US firms, NZ debt ratios remain fairly low. For example, Grinstein and Valles (2008) document a debt ratio of 57%.

Industry Classification

Raheja (2005) and Adams and Ferrira (2007) suggest that the composition of the board should optimally differ across industries. Motivated by this, CEO board membership choice may be optimally different across industries. In order to control for factors that may differ across industries and are not directly observable, industry dummies are used as control variables in the analysis.

Table 19 provides a summary of different degrees of CEO board involvement using the NZX industry classification.[12] Column (2) of Table 19 shows that CEO board participation varies with industry types. Specifically, all the firms in Building Materials & Construction have their CEOs on the board whereas the probability of CEO board membership is only 15.15% in Ports and 20.63% in Energy Processing. Column (3) shows that six industries have never had CEO duality in any given sample year. Even among the other ten industries, the occurrences of CEO duality are relatively few except the probability of CEO duality is 42.5% in Mining and 38.46% in Property.

[12]Apple Fields Limited, Paynter Timber Group Limited and Pure New Zealand Limited changed their nature of business, hence experienced a change in industry classification. However, only the change for Paynter Timber Group Limited occurred during the sample period.

Table 19 CEO Board Involvement by Industry

This table shows the summary statistics of different degrees of CEO board involvement for the 16 industry categories based on the NZX industry classification. A full list of the industries appears in column (1) followed by the sample size in the parentheses. Column (2) shows the number (percentage in the parentheses) of firms with CEOs on the board and column (3) shows the number (percentage in the parentheses) of firms with CEO duality in a given industry.

Industry Classification	CEOs on Board (%)	CEO Duality(%)
(1)	(2)	(3)
Agricultural and Fishing(85)	54(63.53%)	2(2.35%)
Mining (40)	33(82.50%)	17(42.50%)
Forestry and Forest Products(26)	10(38.46%)	0(0%)
Building Materials and Construction(31)	31(100%)	4(12.90%)
Energy Processing (63)	13(20.63%)	0(0%)
Food and Beverages (41)	26(63.41%)	3(7.32%)
Textiles and Apparel (28)	25(89.29%)	1(3.57%)
Intermediate and Durables(95)	79(83.16%)	0(0%)
Property (39)	32(82.05%)	15(38.46%)
Transport (44)	37(84.09%)	0(0%)
Ports (66)	10(15.15%)	0(0%)
Leisure and Tourism(61)	45(73.77%)	1(1.64%)
Consumer (130)	117(90%)	1(0.77%)
Media and Telecommunications(49)	46(93.88%)	5(10.20%)
Finance and Other Services (66)	54(81.82%)	0(0%)
Investment(103)	82(79.61%)	10(9.71%))

5.3 Summary of Impact of Each Determinant based on Shareholder Value Maximization Argument and Managerial Utility Maximization Argument

Table 20 provides a summary of the impact of each determinant variable discussed in Sections 5.2.1, 5.2.2 and 5.2.3 on the choice of CEO board membership based on the share-

holder value maximization argument and the managerial utility maximization argument, respectively.

Table 20 Summary of Effect of Each Determinant Variable based on Shareholder Value Maximization and Managerial Utility Maximization Argument

This table summarizes the impacts of the determinant variables on CEO board membership decision based on the shareholder value maximization argument and the managerial utility maximization argument, respectively.

	Shareholder Value	Managerial Utility
Information Opacity Variables		
Sales	+	+
Market Capitalization	+	+
Number of Business Units	+	+
Number of Geographic Units	+	+
Firm Age	+	+
Tobin's Q Ratio	+	+
Governance Strength Variables		
Block Shareholdings	+	−
Board Size	−	+
Percentage of Independent Directors	+	−
Multiple Directorships in Independent Companies	?	?
Multiple Directorships in Listed Companies	?	?
Board Ownership	+	−
Debt Ratio	+	−

5.4 Model Specification and Methodology

Based on the hypotheses developed in Section 5.1, a general form of an estimation model is as follows:

$$\begin{aligned}\text{CEO Board Membership}_{i,t} = \alpha_0 &+ \alpha_1 \text{Information Opacity Variables}_{i,t} \\ &+ \alpha_2 \text{Governance Strength Variables}_{i,t} \\ &+ \alpha_3 \text{Control Variables} + \varepsilon_{i,t}\end{aligned} \tag{5.3}$$

Where i identifies individual firm and t indicates time. The dependent variable equals 0 if the CEO is off the board, 1 if the CEO is on the board. "Information Opacity Variables" are variables describing firms' information environment in Section 5.2.1, "Governance Strength Variables" are variables describing firms' governance environment in Section 5.2.2 and ε is the error term.

Since the dependent variable takes the value of 0s and 1s, this model is analyzed with a probit estimation technique.[13] The logic behind the probit model is as follows:

$$y_i^* = \beta X_i^* + \varepsilon_i \tag{5.4}$$

X^* is a set of explanatory variables and ε follows a standard normal distribution, ie., $\varepsilon \sim N(0,1)$. y_i^* is unobservable and the relationship between y_i and y_i^* is as follows:

$$\begin{aligned} y_i &= 0 \text{ if } y_i^* \leq 0 \\ y_i &= 1 \text{ if } y_i^* > 0 \end{aligned} \tag{5.5}$$

It follows that the probability of observing each value of y is given by

$$\begin{aligned} P_i(y_i &= 0 \mid x_i) = P_i(y_i^* \leq 0) = P_i(\varepsilon \geq \beta X_i^*) \\ P_i(y_i &= 1 \mid x_i) = P_i(y_i^* > 0) = P_i(\varepsilon > -\beta X_i^*) \end{aligned}$$

[13]The analysis is also replicated with logit estimation technique. The logistic regression is identical to the probit model and the main difference is the distribution of the error term, ie., if the $\varepsilon_{i,t}$ follows a standard normal distribution, a probit model should be used; if $\varepsilon_{i,t}$ follows a logistic distribution, a logistic model should be used.

The estimated probabilities are between 0 and 1. There are two issues involved when analyzing equation (5.3) and they are independence and endogeneity concerns. Hermalin and Weisbach (1998) and Linck et al. (2008) suggest that board structure is relatively persistent over time, raising concerns for the independence of the year-to-year firm level observations. In order to address this issue, I estimate robust standard errors incorporating firm-level clustering. Petersen (2009) shows that when one persistent firm characteristic is regressed on other firm characteristics, the standard errors clustered by firm are unbiased and produce correctly sized confidence interval. The theoretical rationale behind this is discussed in Appendix A.3. A few studies that probe determinants of governance structures also estimated standard errors with firm-level clustering, such as Linck et al. (2008) and Dey et al. (2009). The regression analysis in this study estimates standard errors incorporating firm level clustering unless stated otherwise. Endogeneity occurs when the error term and one or more of the explanatory variables in the model are correlated. There are many reasons why the explanatory variables and the error term might not be independent. There are two reasons that may be relevant in this study. The first one is associated with omitted variable(s). For example, the answer to the choice of CEO board membership might reflect cognitive aspects such as unobservable CEO and director personalities (ambitious, aggressive, lazy...), industry convention and period effect. For this reason, the residual of the model may include measurement errors related to these omitted variables. If these variables are independent of the explanatory variables in the model, the estimated coefficients would still be unbiased. However, it is unlikely that this would be the case. For instance, some CEO personalities may be correlated with firm characteristics, such as firm size (eg., aggressive CEOs may be more willing to expand firm size than conservative CEOs). In this case, firm size will be correlated with the error term and the OLS estimate of firm size will be positively biased. Similarly, industry characteristics may make some types of companies larger than other types by default and unobservable year effect may have effects on some firms more than other firms. These omitted characteristics are correlated with firm size, and may have impacts on the choice of CEO board membership. In this case, the OLS estimate of firm size will be biased.

A second reason why the explanatory variables and the error term might be correlated is due to simultaneity. This occurs when the explanatory variables affect the dependent

variable, but the dependent variable also affects the explanatory variables. This situation is sometimes called "reverse causality". For example, independent directors may affect CEO board participation based on the level of monitoring it provides, and at the same time, CEO board membership may also influence board independence through participating in the board selection process (Hermalin and Weisbach, 1998).

To reduce endogeneity problems, a common approach is to include fixed effects in the estimation regressions. This method takes advantage of a panel dataset and adds dummy variables into the model. By adding these dummies, it is assumed that all the unobserved heterogeneity that leads to the correlation is constant or changing uniformly over time. Suppose some components of information environment, that are not fully captured by my proxies, are constant or changing uniformly over time and are captured by the error term $\varepsilon_{i,t}$ in equation (5.3). By putting a dummy variable (an intercept), the estimated values of the respective dummy variables (intercepts) provide estimates of these unmeasurable or unobservable components for each firm. Since the components that are causing the correlation are no longer included in the error term, the correlation between the error term and the explanatory variable(s) disappears. These explanatory variables are now correlated with the dummy variables that are now included in the model, and it turns the problem to multi collinarity, not endogeneity. Unlike endogeneity, multi collinearity does not cause OLS to produce biased and inconsistent coefficient estimates.

For example, a number of studies (eg.,Dey et al. (2009), Linck et al. (2008)) include industry and year dummy variables to remove the endogenous bias from industry and year effects. Following this approach, I also include industry and year dummy variables in the analysis.

5.5 Preliminary Data Analysis

Preliminary data analysis is carried out to compare the means and medians of the information opacity variables and governance strength variables discussed in Sections 5.2.1 and 5.2.2 for the two categories of sample firms: CEO-off-the-board firms and CEO-on-the-board firms. T-tests are performed to justify the significance for differences in means while Wilcoxon tests are performed for differences in medians. The univariate analysis

can provide some intuition on whether differences in the information environment and the governance environment are associated with firms' CEO board membership choice.

Given that the results of the JB normality test from Sections 5.2.1 and 5.2.2 demonstrate that none of the data samples for non-binary variables are normally distributed and some variables show obvious skewness, the median figures might be seen as a better indication of tendency than means in these cases. Hence, Wilcoxon values are also important statistical analysis tools to justify the results in this study. Table 21 reports the summary statistics and differences in means and medians for firms with CEOs on the board and those with CEOs off the board.

Overall, the results of the univariate analysis show that CEO board membership is affected by the opacity of firms' information environment and the strength of governance environment. To be more specific, firms with CEOs on the board are related to higher sales values, more business units and location units, longer listing period, and greater Tobin's Q ratio. Moreover, these relationships are statistically significant. These observed relationships are consistent with both shareholder value maximization and managerial utility maximization that more opaque information environment is associated with a greater probability of CEO board membership.

Furthermore, firms with CEOs on the board tend to have larger boards, a smaller percentage of independent directors on the board, directors with fewer outside board appointments in independent companies, and smaller block shareholdings. The relationships with board size, percentage of independent directors on the board, and block shareholding show that a stronger governance environment is associated with a lower probability of CEO board membership whereas a weaker governance environment is associated with a greater probability of CEO board membership, suggesting that these relationships are driven by CEO interests. The results of multiple directorships are harder to interpret given the alternative explanations of this variable: when multiple directorships are used as a proxy for director busyness, the results indicate less busy directors are related with a higher probability of CEO board participation, implying the relationship is shareholder interests driven; when multiple directorships are regarded as a proxy for director abilities, the results mean that less capable directors are associated with a higher probability of CEO board membership, implying that the results are driven by CEO interests.

However, it is important to realize that the results from the preliminary analysis should be interpreted with caution since some of these variables may be correlated, causing the impact on CEO board membership to be contaminated by such relationships.

Table 22 presents the correlations among variables. The results show that some of the variables are significantly correlated, causing concerns for contaminating the relationships between these variables and CEO board membership examined in Table 21. For example, the result shows that there is a positive relationship between board size and firm size. Hence, the positive relationship between CEO board membership and board size may, in fact, capture the relationship between CEO board membership and firm size. Therefore, the results from Table 21 cannot confirm the existence of a positive relationship between CEO board membership and board size. In order to disentangle such relationships, I run multivariate regression analysis that controls for different attributes.[14]

[14]It may be important to acknowledge that an extremely high correlation between the explanatory variables violates the classical assumption of no perfect multicollinearity. The inclusion of two perfectly collinear variables in the same regression does not add additional information to the regression analysis. However, according to Tabachnick and Fidell (1996), a bivariate correlation greater than 0.7 requires special concerns. None of the correlations in Table 22 exceed this statistical criterion (except for the correlation between sales and market capitalization). Moreover, since the common practice in prior corporate governance literature includes both firm size and board size in their analysis, I also use both of them in the multivariate regression analysis.

Table 21 Summary Statistics of CEO Board Membership

This table reports the summary statistics of variables describing firms' information environment and governance environment for firms with CEOs on the board and firms with CEOs off the board between 1997 to 2008. Definitions of information environment variables are:*sales* is the real sales in 1997 dollars;*market capitalization* is calculated as the number of shares on issue times share price at the balance date and expressed in 1997 dollars;*firm age* is the number of years since firms listed on NZX;*Tobin's Q ratio* is the ratio of the sum of market capitalization, long-term debt, the difference of current assets and short-term debt to total assets. Governance Environment variables include:*board size* is the number of directors on the board;*multiple directorships(independent)* is the total number of extra board memberships in independent companies held by all board members (except CEO);*multiple directorships(list)* is the total number of board memberships in listed companies held by all board members (except CEO);*board ownership* is percentage of company shares held by all directors (except CEO);*block shareholding* is the total sum of all shareholdings held by substantial shareholders where a substantial shareholder is defined as a person who holds 5% or more of a company's stock. The sample sizes fall in these two categories of firms are reported next to the variable names. The figures in the parentheses underneath the mean values are the standard deviations. The t-test and the Wilcoxon test are performed for the differences in means and medians. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	CEOs off the Board		CEOs on the Board			
	Mean	Median	Mean	Median	T test	Wilcoxon test
Panel A: Information Opacity Variables						
Sales(NZD millions)(277,695)	228.73	52.42	371.34	108.99	***	***
	(488.25)		(720.83)			
Market Capitalization(NZD millions)(276,696)	351.77	76.38	463.54	84.46		
	(741.03)		(1,433.73)			
Number of Business Units(277,695)	1.59	1.00	1.81	1.00	**	*
	(1.12)		(1.30)			
Number of Location Units(277,695)	1.34	1.00	1.71	1.00	***	***
	(0.73)		(0.95)			
Firm Age (268,652)	12.26	9.00	15.82	11.00	***	
	(10.39)		(16.84)			
Tobin's Q Ratio(274,680)	1.44	1.17	1.66	1.25	**	**
	(1.27)		(1.42)			
Panel B: Governance Strength Variables						
Board Size(277,695)	5.99	6.00	6.29	6.00	**	***
	(2.04)		(1.71)			
Percentage of Independent Directors(%)(270,690)	69.58	66.67	55.99	55.56	***	***
	(1.54)		(0.77)			
Board Ownership(%)(277,695)	15.65	2.03	15.77	3.89		
	(23.16)		(21.31)			
Multiple Directorships(Independent)(277,695)	46.15	36.00	37.01	27.00	***	***
	(36.01)		(36.54)			
Multiple Directorships (Listed)(277,695)	2.54	2.00	2.49	2.00		
	(2.52)		(2.63)			
Block Shareholding(%)(267, 678)	61.51	70.72	48.99	50.25	***	***
	(22.55)		(21.89)			

Table 22 Cross-Correlation Table

This table presents the correlation matrix of the variables. Column and row definitions are as follows: (1)Sales, (2)Market Capitalization, (3) Number of Business Units, (4) Number of Location Units, (5) Firm Age, (6) Tobin's Q, (7) Board Size, (8) Percentage of Independent Directors, (9) Multiple Directorships(Independent) (10) Multiple Directorships(Listed), (11) Board Ownership, (12) Block Shareholdings. The values in parentheses under the correlation coefficients are p-values.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	1.00											
(2)	0.76	1.00										
	(0.00)											
(3)	0.34	0.18	1.00									
	(0.00)	(0.00)										
(4)	0.15	0.09	0.22	1.00								
	(0.00)	(0.01)	(0.00)									
(5)	0.03	0.02	-0.01	0.10	1.00							
	(0.36)	(0.51)	(0.91)	(0.00)								
(6)	-0.11	0.08	-0.20	-0.01	-0.08	1.00						
	(0.00)	(0.02)	(0.00)	(0.88)	(0.02)							
(7)	0.42	0.38	0.16	0.16	0.15	-0.13	1.00					
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)						
(8)	0.11	0.14	-0.04	-0.04	-0.16	-0.06	-0.10	1.00				
	(0.00)	(0.00)	(0.25)	(0.22)	(0.00)	(0.08)	(0.00)					
(9)	0.05	-0.01	0.14	0.12	-0.07	0.01	0.09	0.03	1.00			
	(0.12)	(0.93)	(0.00)	(0.00)	(0.04)	(0.67)	(0.01)	(0.33)				
(10)	0.31	0.32	0.14	0.04	-0.18	0.02	0.29	0.14	0.19	1.00		
	(0.00)	(0.00)	(0.00)	(0.22)	(0.00)	(0.49)	(0.00)	(0.00)	(0.00)			
(11)	-0.15	-0.20	-0.03	0.01	-0.02	-0.05	-0.09	-0.27	0.02	-0.20	1.00	
	(0.00)	(0.00)	(0.37)	(0.82)	(0.53)	(0.10)	(0.00)	(0.00)	(0.58)	(0.00)		
(12)	-0.01	0.04	-0.07	-0.25	0.05	-0.16	0.03	-0.08	-0.09	-0.13	0.16	1.00
	(0.78)	(0.22)	(0.03)	(0.00)	(0.14)	(0.00)	(0.39)	(0.02)	(0.01)	(0.00)	(0.00)	

5.6 Regression Analysis and Discussion of Results

The results obtained from estimating equation (5.3) appear in Table 23. The first column reports the results by suppressing the governance environment-related variables and including only the information environment-related variables and control variables. The estimation coefficients from column (1) suggest that firm size, measured by annual sales, is positively related to the CEO board membership dummy variable. In addition, the probability of CEO board membership is non-linearly related with firm age: that is, CEO board membership is negatively related to firm age and positively related to firm age squared. This result provides evidence for the response to the change in firms' information environment from shareholders' perspective and CEOs' perspective. Firms' information environment is relatively less opaque when they are relatively young. Both shareholders and the CEO have less desire for CEO board participation. As firm age increases, firms' information environment becomes more opaque. Both shareholders and the CEO have greater incentives for CEO board membership, hence shareholder interests and CEO interests are aligned, which results in a higher probability of CEO board participation. Although the coefficients for the number of business units, the number of location units and Tobin's Q ratio are statistically insignificant, they have the expected signs. As expected, the coefficient for debt ratio is negative, however it is statistically insignificant.

Column (2) reports the estimation results when firm size is replaced with market capitalization. Similar to that estimated in column (1), firm size is positively related to the probability of CEO board membership and is statistically significant at the 1% level. Firm age is negatively associated with CEO board membership whereas firm age squared is positively associated with CEO board membership.

Column (3) shows the estimation results with the governance strength variables and control variables as the only explanatory variables. The governance strength variables are statistically significant, lending support to the managerial utility maximization argument that a stronger corporate governance environment discourages CEO board participation while a weaker corporate governance environment is conducive to CEO entrenchment, manifested through a higher probability of CEO board membership. Specifically, CEO board membership is less (more) likely in the presence of a smaller (larger) board, greater

Table 23 Regression Results of Determinants of CEO Board Membership

This table reports the results from a probit regression where the dependent variable equals one if CEOs are on the board and 0 otherwise. The dependent variable is regressed on the variables described in equation (5.3). Terms in parentheses are standard errors based on estimation with firm-level clustering. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	−1.845**	−2.447**	1.131	1.092	-1.047	-1.382
	(0.845)	(1.004)	(0.708)	(0.698)	(0.963)	(1.001)
Ln Sales	0.202***				0.213***	
	(0.068)				(0.078)	
Ln Market Capitalization		0.276***				0.290***
		(0.091)				(0.094)
Number of Business Units	0.054	0.041			0.050	0.032
	(0.072)	(0.074)			(0.066)	(0.072)
Number of Location Units	0.028	0.028			0.097	0.110
	(0.138)	(0.141)			(0.149)	(0.146)
Firm Age	−0.035**	-0.030ˆ**			−0.057***	−0.055*
	(0.018)	(0.019)			(0.018)	(0.026)
Firm Age Squared	0.001**	0.001*			0.001***	0.001
	(0.000)	(0.001)			(0.000)	(0.001)
Tobin's Q Ratio	0.072	-0.053			0.091	-0.050
	(0.085)	(0.082)			(0.097)	(0.104)
Board Size			0.145**	0.108	0.098	0.059
			(0.064)	(0.066)	(0.068)	(0.068)
Percentage of Independent Directors(%)			−0.013***	−0.014***	−0.017***	−0.019***
			(0.005)	(0.004)	(0.005)	(0.005)
Board Ownership(%)			−0.008**	−0.008**	−0.010**	−0.009**
			(0.004)	(0.029)	(0.004)	(0.004)
Multiple Directorships in Independent Companies			−0.006***		−0.008***	−0.008***
			(0.002)		(0.002)	(0.002)
Multiple Directorships in Listed Companies				0.014		
				(0.038)		
Block Shareholding(%)			-0.005	-0.004	-0.005	-0.005
			(0.005)	(0.005)	(0.005)	(0.005)
Debt Ratio(%)	-0.002	0.0003	0.002	0.002	0.003	0.006
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of Observations	872	872	900	900	839	839
Pseudo R^2	0.339	0.347	0.356	0.335	0.446	0.451

(smaller) percentage of independent directors, greater (smaller) board ownership and more (less) capable directors on the boards of independent companies (Note, if multiple directorships are regarded as director busyness, the negative coefficient provides evidence for the shareholder value maximization argument since it indicates a busier board ie., a weaker governance environment, is associated with a lower probability of CEO board membership). Column (4) shows the same estimation procedure but replaces multiple directorships in independent companies with multiple directorships in listed companies. Unlike the results of column (3), the coefficient for board size becomes insignificant although still positive. More importantly, the coefficient for multiple directorships in listed companies is statistically insignificant. Due to this insignificance, the following estimations use multiple directorships in independent companies only.

To get an overall understanding of the probability of CEO board membership, I include both the information environment variables and the governance environment variables and report the results in column (5) and (6). The results do not differ significantly compared to that estimated separately, except that the coefficient for board size loses its significance. In addition, the percentage of independent directors on the board, board ownership and multiple directorships in independent companies are negatively associated with the probability of CEO board membership and are statistically significant. These models provide evidence that the probability of CEO board membership is positively related to firm size and non-linearly related to firm age, and negatively related to the strength of governance environment. In other words, at least the negative association between the probability of CEO board membership and the strength of governance environment lends supports to the managerial utility argument.

In addition, I conduct a joint test for the industry dummies and a separate test for joint analysis of the year dummies. Both results show statistical significance at the 1% level, suggesting that industry and year effects play significant roles in explaining the variation in CEO board membership .

The coefficients of a probit model cannot be interpreted directly because instead of a 1-unit increase in X (the explanatory variable) increases Y (the dependent variable) by β (the estimated coefficient), it is interpreted as a 1-unit increase in X (the explanatory variable) raises the z-score of Pr(Y=1) by β (the estimated coefficient). In order to gain some

insights of the economic significance of these variables, I calculate the marginal probabilities where the marginal probability effect is the partial effect of each explanatory variable on the probability that the observed dependent variable, in this case, CEO board membership equals 1. I calculate the marginal effects at the mean and median values of the explanatory variables based on model (5).[15] The results of this exercise appear in Table 24.

The results from Table 24 show that although firm size, firm age, firm age squared, percentage of independent directors on the board, multiple directorships in independent companies, and board ownership have statistical significance, only firm size and percentage of independent directors on the board possess economic significance. Specifically, a 1% increase in firm real sales from the mean (median) value increases the probability of CEO board membership by 5.8 (3.6) percentage points; a one-percentage-point increase in independent directors representation on the board from the mean value causes a 0.5-percentage-point decrease in the probability of CEO board membership. In other words, an additional independent director on a typical NZ board (six members with 3.6 independent directors), while holding other variables at the sample average, decreases the probability of CEO board membership by approximately 8.8 percentage points.[16] Similarly, a one-percentage-point increase in independent directors' representation on the board from the median value causes a 0.3-percentage-point decrease in the probability of CEO board membership. In other words, the probability of CEO board membership decreases by approximately 6.8 percentage points with one additional independent director on the board.[17]

[15]Marginal effects based on model (6) are presented in Appendix A.4

[16]Given the nonlinear function in the probit model, the effect of a unit change in the independent variable varies greatly depending on the initial value chosen to calculate the marginal effect. One additional independent director on a typical NZ board increases the board independence from 60% to 76%. At 60%, the marginal effect is 0.5 percentage-point decrease in the probability of CEO board membership; at 76%, the estimated marginal effect is 0.6 percentage-point decrease in the probability of CEO board membership. Therefore, on average, a 0.55 percentage-point decrease is expected for every percentage-point increase in the percentage of independent director representation from 60% to 76%. Hence, an additional independent director on the board leads to an approximate decrease of 8.8 percentage-points (0.55*16) in the probability of CEO board membership.

[17]This model predicts a 0.55-percentage-point decrease in the probability of CEO board membership when the percentage of independent directors on the board is at 76%. It leads to an approximate average

Table 24 Marginal Probabilities of CEO Board Membership

This table reports the marginal changes in the probabilities of CEO board membership using the output from Model (5) in Table 23. These marginal effects are calculated at the mean and median values of the explanatory variables. Terms in parentheses are standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	Means	Medians
	(1)	(2)
Ln Sales	0.058***	0.036***
	(0.021)	(0.012)
Number of Business Units	0.014	0.008
	(0.019)	(0.012)
Number of Location Units	0.029	0.018
	(0.043)	(0.027)
Firm Age	−0.016***	−0.010***
	(0.005)	(0.003)
Firm Age Squared	0.001***	0.001***
	(0.000)	(0.000)
Tobin's Q Ratio	0.025	0.016
	(0.028)	(0.017)
Board Size	0.027	0.017
	(0.019)	(0.012)
Percentage of Independent Directors	−0.005***	−0.003***
	(0.002)	(0.001)
Board Ownership	−0.003**	−0.002**
	(0.001)	(0.001)
Multiple Directorships (Independent)	−0.002***	−0.001***
	(0.001)	(0.000)
Block Shareholdings(%)	-0.001	-0.001
	(0.001)	(0.001)
Debt Ratio(%)	0.001	0.000
	(0.001)	(0.001)
No. of Observations	839	839

5.7 Determinants of Different Degrees of CEO Board Involvement

5.7.1 Introduction

The purpose of this section is to analyze the determinants of different degrees of CEO board involvement. This is an extension to the analysis carried out in the previous sections. Previous sections discuss and analyze the determinants of CEO board membership where the sample is divided into firms with CEOs off the board and firms with CEOs on the board. In this section, another layer of CEO board involvement - CEO duality - is separated from firms with CEO board membership and included as another degree of CEO board involvement. Firms with dual CEOs indicate their CEOs not only sit on the board of directors, but more importantly, these firms present the other end of the spectrum of CEO board involvement.

In this section, I divide CEO board involvement into three categories: CEOs off the board, CEOs on the board as directors and CEO duality. This classification allows me to examine the determinants of the different degrees of CEO board involvement. Unlike CEOs sitting on the board as directors, CEO duality combines the role of decision management leader and decision control leader, which represents the most significant violation of the agency theory. Hence, an obvious question of interest is what determines firms' choice of the different extent of CEO board involvement.

In order to address this issue, a significant variation in the different degrees of CEO board involvement is required. NZ has a significant number of CEOs who sit off the company board (as illustrated in Table 1). Although there is only a small number of cases of CEO duality (resulting in a small sample size in this category, hence less powerful analysis), NZ still possesses a relatively more balanced dataset in each category compared to other countries, thus permitting me to shed some light on the determinants of different degrees of CEO board involvement.

marginal effect of 0.425 from 60% to 76%. Hence,an additional independent director on the board leads to an approximate decrease of 6.8-percentage-points (0.425*16) in the probability of CEO board membership.

5.7.2 Theoretical Background, Development of Hypotheses and Measurement of Variables

Since there are no obvious reasons that CEO duality is determined by a different theoretical framework, the foundation of the analysis in this section is that shareholder value maximization and managerial utility maximization are relevant in explaining the different extent of CEO board involvement. The shareholder value maximization approach argues the benefits and costs of the different degrees of CEO board involvement whereas the managerial utility maximization approach argues for CEO entrenchment behavior.

Because the shareholder value maximization argument and the managerial utility maximization argument still hold when dual firms are included in the analysis, the hypotheses remain the same as in Section 5.1. Specifically, both the shareholder value maximization argument and the managerial utility maximization argument indicate that CEOs have a higher probability of a higher degree of board involvement in a more opaque information environment; the shareholders value maximization argument suggests that CEOs should be more involved on the board in a stronger governance environment to explore the benefits of other governance mechanisms whereas the managerial utility maximization approach argues that CEOs prefer to be less involved on the board in a strong governance environment to avoid scrutiny.

In this analysis, I use the same set of variables as in Section 5.2 to describe firms' information environment variables, governance environment variables and control variables. In other words, information environment variables are measured by firm size, firm complexity, and growth opportunities and governance environment variables include board size, percentage of independent directors, multiple directorships, board ownership, and block shareholdings. In addition, control variables include debt ratio, industry and period dummy variables.

5.7.3 Preliminary Data Analysis

I conduct an univariate analysis to compare the means and the medians of the variables proxying for the opacity of the information environment and the strength of the governance environment for firms with different degrees of CEO board participation. The univariate

analysis can provide some intuition on whether differences in the information environment and governance environment are associated with firms' CEO board involvement choices. The results of this analysis are reported in Tables 25 and 26 and the statistics provide some important insights for the determinants of different degrees of CEO board involvement.

Table 25 Summary Statistics of Different Degrees of CEO Board Involvement

This table reports the means and the medians of firms' information environment variables and governance environment variables. Sample firms are categorized into those with CEOs off the board, with CEO-director and with CEO duality. Sample sizes for each categories of firms are reported in the parentheses next to the variable names.

	CEO off Board		CEO - Director		CEO Duality	
	Mean	Median	Mean	Median	Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)
Information Opacity Variables						
Sales(millions)(277,636,58)	228.773	53.424	401.492	146.457	48.269	17.587
Market Capitalization(278,636,58)	349.725	76.383	501.744	98.980	58.369	43.107
Number of Business Units(277,636,58)	1.599	1.000	1.840	1.000	1.475	1.000
Number of Location Units(277,636,58)	1.343	1.000	1.726	1.000	1.492	1.000
Firm Age(268, 597, 54)	12.261	9.000	15.880	10.000	15.491	16.000
Tobin's Q Ratio(276,636,58)	1.626	1.242	1.752	1.307	1.527	1.210
Governance Strength Variables						
Board Size(277,636,58)	5.996	6.000	6.426	6.000	4.814	5.000
Percentage of Independent Directors(%)(277,632,57)	69.36	66.67	55.66	55.56	59.95	57.14
Multiple Directorships(Independent)(277,636,58)	46.148	36.000	36.137	27.000	46.372	27.000
Multiple Directorships(Listed)(277,636,58)	2.542	2.000	2.643	2.000	0.847	0.000
Board Ownership(%)(277,636,58)	15.18	1.40	17.94	6.99	21.29	8.76
Block Shareholding(%)(267,620, 57)	61.46	70.72	49.35	50.55	45.27	45.20

Differences between CEO-off-the-Board Firms and CEO-Director Firms

Columns (1)-(4) from Table 25 and columns (1) and (2) from Table 26 report the summary statistics of variables for CEO-off-the-board firms and CEO-director firms and the differences in means and medians of the two categories of firms. Consistent with the shareholder value maximization and CEO utility arguments, a more opaque information environment leads to a greater probability of CEOs sitting on the board. The T tests for the means and the Wilcoxon tests for the medians are statistically significant for proxies for firm size and complexity.

Table 26 Differences in Means and Medians of Different Degrees of CEO Board Involvement

This table reports the differences of the means and the medians of the proxy variables for firms' information environment and governance environment. Levels of significance for the T test and Wilcoxon tests are indicated by ***,**,* for 1%, 5% and 10% respectively.

	CEO off Board vs. CEO-Director		CEO off Board vs. CEO Dual		CEO-Director vs. CEO Dual	
	Mean	Median	Mean	Median	Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)
Information Opacity Variables						
Sales(million)	−3.535***	−5.286***	2.826***	4.269***	3.629***	7.084***
Market Capitalization(million)	−1.612*	−2.186**	2.998***	3.466***	2.258**	4.966***
Number of Business Units	−2.623***	−2.182**	0.854	0.716	2.066**	1.843*
Number of Location Units	−5.907***	−6.764***	-1.431	−2.382**	1.826*	1.382
Firm Age	−3.154***	-0.608	−2.191**	−4.262***	0.167	−2.397**
Tobin's Q Ratio	-1.291	-1.547	0.546	0.773	1.256	1.500
Governance Strength Variables						
Board Size	−3.327***	−4.130***	4.241***	4.184***	7.174***	6.778***
Percentage of Independent Directors(%)	8.552***	7.304***	2.824***	2.483**	-1.526	-1.392
Multiple Directorships(Independent)	3.734***	5.430***	-0.270	1.666*	−2.187**	-0.998
Multiple Directorships(Listed)	-0.658	-0.272	4.930***	6.152***	5.121***	6.034***
Board Ownership(%)	−1.696*	−4.236***	−1.758*	−2.658***	-1.108	-0.929
Block Shareholding(%)	7.491***	7.845***	4.858***	4.936***	1.206	1.257

With regards to firms' governance environment, the results are more ambiguous. Specifically, firms with CEOs on the board are associated with larger board size, lower percentage of independent directors, less multiple directorships in independent companies, and less block shareholdings. Since these variables represent a weaker governance environment, the results are consistent with the CEO-interests argument. On the other hand, the probability of CEOs on the board as directors is positively associated with board ownership, indicating a shareholder-interests' driven relationship.

Differences between CEO-off-the-Board Firms and Dual Firms

Columns (1), (2), (5), and (6) from Table 25 and columns (3) and (4) from Table 26 report the summary statistics of variables describing the information environment and the governance environment for firms with CEOs off the board and dual firms. Contrary to

expectations, firm size variables are negatively related to the probability of firms adopting dual structure. However, the number of location units and firm age are positively related to the higher degree of CEO board involvement.

Furthermore, the negative relationships with the percentage of independent directors and block shareholding provide evidence that the relationships are driven by CEO entrenchment. Shareholders, on the other hand, attempt to protect their interests through board size and board ownership. Similar to the previous analysis, the interpretation of multiple directorships is ambiguous given the alternative understanding of these variables.

Differences between CEO-Director Firms and Dual Firms

Columns (3) -(6) from Table 25 and columns (5) and (6) from Table 26 report the differences in means and medians of various characteristics of CEO-director firms and dual firms. The results show that all measures of information opacity present negative relationships with the probability of adopting a dual leadership structure. In terms of proxies for firms' governance environment, the results are also mixed. For example, the negative relationship between the probability of the higher degree of CEO board involvement and block shareholding and multiple directorships in listed companies (when interpreted as board abilities) indicates that the observed dual structure is CEO utility driven whereas the relationship with board size and multiple directorships in independent companies (when interpreted as board abilities) indicates that shareholder' interests play a role in determining the level of CEO board involvement.

Summary

After comparing each pair of the three categories of firms, I now look at the three categories of firms as a whole. Since the three categories of firms represent a range from the smallest degree of CEO board involvement (CEO off the board) to the highest degree (CEO duality), this discussion allows me to gain some insights on how each determinant affects the degree of CEO board involvement without controlling for other variables.

First, a number of determinant variables present non-linear relationships with the degree of CEO board involvement when other variables are not controlled for. These variables are firm size, firm complexity, firm age, Tobin's Q ratio, board size, percentage

of independent directors, and multiple directorships. In another words, the effects of these variables on the probabilities of higher degrees of CEO board involvement do not move in only one direction as the values of these variables increase. This is an important finding since prior studies on the examination of the determinants of CEO duality assume a linear relationship between these variables and CEO duality. The lack of literature (and data) on CEO board membership as directors may falsely attribute the resulting relationship to CEO duality instead of CEOs on the board as directors. In order to examine the relationship between these determinant variables and the extent of CEO board involvement, the quadratic terms of these variables are included in the regression analysis that follows. The inclusion of the quadratic terms in the regressions allows me to test the non-linearity of these variables when holding other variables constant.

Second, the expected relationships between information opacity and the degree of CEO board involvement are only realized at the lower level of CEO board involvement. Specifically, a positive relationship between the opacity of firms' information environment and the probability of a higher degree of CEO board involvement is only observed when comparing firms with CEOs off the board and firms with CEOs on the board as directors. The relationships are generally reversed when comparing firms with CEOs holding the director title and firms with CEOs holding the chair position. In terms of the strength of governance environment, only board ownerships and block shareholdings show consistent results across the three categories of firms. Board ownership and the degree of CEO board involvement are positively related, indicating that the relationship is driven by shareholder interests. Block shareholding is negatively related to the degree of CEO board involvement, providing evidence that the observed level of CEO board participation is driven by CEO interests. These results also show that the effects of board size, percentage of independent directors, and multiple directorships in independent companies (when interpreted as board ability) are CEO utility driven when moving from CEOs off the board to CEO directors while the effects of these variables become shareholder interests' driven when moving from CEO directors to CEO duality. The reverse holds true for the effects of multiple directorships in listed companies.

The results from the preliminary analysis should be interpreted with caution as it does not control for characteristics that could be correlated with the decision on the different

degrees of CEO board involvement. The next step is, therefore, to run more sophisticated regressions that control for different attributes. This is the issue I will now turn to.

5.7.4 Regression Analysis

This section provides regression analysis of the determinants of the different extent of CEO board involvement. Since the dependent variable has three catergories and in rank order, an ordered probit model is used to analyze equation (5.3). The rationale behind the ordered probit model is presented as follows:

Suppose a relationship is characterized as:

$$y_i^* = \beta X_i^* + \epsilon_i \tag{5.6}$$

Where y^* is the exact but unobserved dependent variable, X^* is the vector of independent variables, β is the vector of regression coefficients, and ϵ is the standard error. If $\epsilon \sim N(0,1)$, a probit model should be used. Because y^* is not observable, thus latent variable, we can only observe the categories of response:

$$\begin{aligned} y_i &= 0 \text{ if } y_i^* \leq \gamma_1 \\ y_i &= 1 \text{ if } \gamma_1 < y_i^* \leq \gamma_2 \\ y_i &= 2 \text{ if } \gamma_2 < y_i^* \end{aligned}$$

The ordered probit technique uses the observed y to find the parameter vector β. It follows that the probabilities of observing each value of y are given by

$$\begin{aligned} P_i(y_i &= 0 \mid x_i, \beta, \gamma) = F(\gamma_1 - x_i'\beta) \qquad (5.7) \\ P_i(y_i &= 1 \mid x_i, \beta, \gamma) = F(\gamma_2 - x_i'\beta) - F(\gamma_1 - x_i'\beta) \\ P_i(y_i &= 2 \mid x_i, \beta, \gamma) = 1 - F(\gamma_2 - x_i'\beta) \end{aligned}$$

(5.8)

Where $x_i'\beta$ is a set of specific values of x for the estimated coefficients β and the threshold values γ's. F is the cumulative distribution function of the residual ϵ. The estimated

probabilities are between 0 and 1 and sum up to 1. Positive coefficients in the ordered probit regression mean that higher levels of CEO board involvement are more likely to be observed. Table 27 reports the estimation output for the determinants of CEO board involvement.[18]

Table 27 Regression Results of Determinants of CEO Board Involvement

This table reports the results from an ordered probit regression where the dependent variable - CEO Board Involvement - equals 0 if CEOs are off the board, 1 if CEOs are on the board and 2 if CEOs chair the board. Coefficients are reported in the table and standard errors are based on firm level clustering and reported in parenthesis. ***, **, * denotes significance at the 0.01, 0.05, 0.1 level.

	(1)	(2)	(3)	(4)	(5)
Ln Sales	0.110*			0.108*	0.072
	(0.058)			(0.061)	(0.059)
Number of Business Units	-0.009			-0.025	0.153
	(0.056)			(0.055)	(0.174)
Number of Location Units	-0.048			0.026	0.173
	(0.129)			(0.104)	(0.296)
Firm Age	0.002			0.001	−0.030**
	(0.006)			(0.007)	(0.012)
Tobin's Q Ratio	0.028			0.032	0.141**
	(0.066)			(0.069)	(0.082)
Board Size		0.038	0.040	-0.013	0.253
		(0.309)	(0.051)	(0.054)	(0.261)
Percentage of Independent Directors(%)		−0.008**	−0.008**	−0.011***	0.038**
		(0.003)	(0.003)	(0.004)	(0.261)
Multiple Directorships(Independent)		-0.002		-0.003	−0.017**
		(0.002)		(0.003)	(0.007)
Multiple Directorships(Listed)			-0.024		
			(0.031)		
Board Ownership(%)		-0.005	−0.006*	−0.006*	-0.010
		(0.004)	(0.004)	(0.004)	(0.010)
Block Shareholdings (%)		-0.004	-0.004	-0.004	0.016
		(0.004)	(0.004)	(0.004)	(0.017)

Continued on next page

[18]Appendix A.5 presents the regression results when firm size is measured by market capitalization.

Table 27 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
Quadratic Effects					
Number of Business Unites					-0.024
					(0.023)
Number of Location Units					-0.029
					(0.054)
Firm Age					0.0004***
					(0.0001)
Tobin's Q Ratio					−0.018**
					(0.014)
Board Size					-0.017
					(0.017)
Percentage of Independent Directors(%)					−0.0004***
					(0.0001)
Multiple Directorships(Independent)					0.0001***
					(0.000)
Board Ownership(%)					0.000
					(0.000)
Block Shareholdings (%)					-0.0002
					(0.0002)
Boundary Parameters					
limit 1	0.676	-1.430	-1.413	-0.549	1.767
limit 2	3.402	1.359	1.379	2.353	4.780
Control Variables					
Debt Ratio(%)	-0.001	-0.001	-0.001	0.000	0.004
	(0.766)	(0.801)	(0.003)	(0.004)	(0.004)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	900	931	971	867	867
Adjusted R^2	0.260	0.270	0.268	0.311	0.350

Column (1) reports the results when only variables describing firms' information environment and the control variables are included as explanatory variables. While holding debt ratio, year effects and industry effects constant, firm size is positively associated with the probability of a higher degree of CEO board involvement and is statistically significant

at 10% level. The boundary parameters are the values where the observed degree of CEO board involvement is cut to make the three groups. That is,

$$\begin{aligned}
\text{CEO Board Involvement} &= 0 \text{ if estimated latent variable} \leq 0.676 \\
\text{CEO Board Involvement} &= 1 \text{ if } 0.676 < \text{estimated latent variable} \leq 3.402 \\
\text{CEO Board Involvement} &= 2 \text{ if estimated latent variable} > 3.402
\end{aligned}$$

Column (2) presents the regression results when the governance environment variables and the control variables are included. The result shows that the percentage of independent directors on the board is negatively related to a higher degree of CEO board participation and is significant at the 5% level. Although the coefficients for other variables are not significant, their estimated signs suggest negative relationships between the extent of CEO board involvement and the strength of firms' governance environment. The boundary values indicate that

$$\begin{aligned}
\text{CEO Board Involvement} &= 0 \text{ if estimated latent variable} \leq -1.430 \\
\text{CEO Board Involvement} &= 1 \text{ if} -1.430 < \text{estimated latent variable} \leq 1.359 \\
\text{CEO Board Involvement} &= 2 \text{ if estimated latent variable } > 1.359
\end{aligned}$$

Column (3) presents the results when multiple directorships in independent companies in model (2) is replaced with multiple directorships in listed companies. Similar to the result from model (2), the percentage of independent directors on the board is negatively associated with the probability of CEO board involvement. A major difference between model (2) and (3) is that the negative relationship between board ownership and CEO board involvement is now statistically significant at the 10% level. Since the coefficient for multiple directorships in listed companies is statistically insignificant, the following analysis uses multiple directorships in independent companies as the only proxy for board ability or board busyness.

Column (4) presents the results for the full model by including the information environment variables, the governance environment variables, and the control variables in the

regression. The results show the degree of CEO board involvement is positively affected by firm size, negatively affected by the percentage of independent directors on the board, and board ownership. The values that cut the latent variable into the three groups of firms are operationalized as follows:

$$\begin{aligned}
\text{CEO Board Involvement} &= 0 \text{ if estimated latent variable} \leq -0.549 \\
\text{CEO Board Involvement} &= 1 \text{ if} -0.549 < \text{estimated latent variable} \leq 2.353 \\
\text{CEO Board Involvement} &= 2 \text{ if estimated latent variable} > 2.353
\end{aligned}$$

The interpretation of the ordered probit model is not straightforward. The estimated coefficients for the ordered probit model have no direct interpretation but can be used to calculate probabilities of obtaining a different degree of CEO board involvement and their corresponding marginal probabilities. It may help to plug in some hypothetical or real data to get a better understanding for the coefficients' meanings. For example, using the predicted coefficients from column (4) of Table 27, the estimate of $x_i'\beta$ for Telecom Corporation NZ 2001 is 1.325. This is the "best guess" for the value of y^* and this value places Telecom Corporation NZ 2001 in the y=1 threshold. However, due to the random disturbance term, there is a probability that y^* is greater than 1.325. In this situation, this could move Telecom Corporation NZ 2001 into a higher category, eg., the y^* value could be 4, in which case y would equal 2. In contrast, if y^* is, in fact, -0.5, this could move this company into a lower category. Using equation (5.7), P(y=0) = 0.044, P(y=1)= 0.840, P(y=2)=0.116. Therefore, y=1 is the most likely value for Telecom Corporation NZ 2001. In addition, given that $x_i'\beta$ is 1.325, which is slightly closer to the higher limit, there is a higher probability of falling in the higher category (11.6%) than falling in the lower category (4.4%).

Marginal effects for an ordered probit model are simply the first derivative of the calculated probabilities from equation (5.7) with respect to the explanatory variables and can easily be calculated via the chain rule. Table 28 reports the marginal effects of the explanatory variables on the probabilities of falling into each of the three degrees of CEO board involvement categories.

Table 28 shows a 1% increase in the firm sales results in 3.3 percentage-points decrease

Table 28 Impacts of Explanatory Variables on CEO Board Involvement for Model 4

This table reports the marginal effects of the explanatory variables at the means from Model (4) in Table 27 on the extent of CEO board involvement. The marginal effects are calculated as the derivatives of the probability of falling in each of three degrees of board involvement with respect to the estimated coefficients of each explanatory variables. ***, **, * denotes significance at the 0.01, 0.05, 0.1 level.

$\frac{\delta \text{Probability of falling in each category}}{\delta \text{respective explanatory variables}}$	CEO off Board	CEO-Director	CEO-Chair
Ln Sales	-0.033^{**}	0.028^{*}	0.004^{*}
Number of Business Units	0.008	-0.007	-0.001
Number of Location Units	-0.008	0.007	0.001
Firm Age	-0.001	0.000	3.11e-06
Tobin's Q Ratio	-0.010	0.008	0.001
Board Size	0.004	-0.003	-0.001
Percentage of Independent Directors	0.003^{***}	-0.0028^{***}	-0.0004^{**}
Multiple Directorships (Independent)	0.001	-0.001	-0.0001
Board Ownership(%)	0.002^{*}	-0.002^{*}	-0.0002
Block Shareholding(%)	0.001	-0.001	-0.0002

in the probability of CEO off the board, 2.8 percentage-points increase in the probability of CEO on the board and 0.4 percentage-point increase in the probability of CEO duality; a one-percentage-point increase in the percentage of independent directors on the board increases the probability of CEOs off the board by 0.3 percentage-point, decreases the probability of CEOs on the board by 0.28 percentage-point and the probability of CEOs chairing the board by 0.04 percentage-point. In other words, an additional independent director on the board increases the probability of CEOs off the board by 4.8 percentage-points, decreases the probability of CEOs on the board by 4.48 percentage-points and the probability of CEO duality by 0.64 percentage-points. Moreover, a one-percentage-point increase in board ownership increases the probability of CEOs off the board by 0.2 percentage points, decreases the probability of CEOs on the board by 0.2 percentage point and the probability of CEO duality by 0.02 percentage points.

Column (5) of Table 27 reports the estimation results when variables that have shown non-linearity in Table 25 are included. The estimation results show that firm age, percentage of independent directors on the board and multiple directorships in independent companies have shown non-linear relationships with CEO board involvement. To provide more intuitive interpretations of these non-linear relationships, the results from Table 28 need to be combined with the marginal effects of the explanatory variables. The marginal effects of these variables appear in Table 29.

Table 28 shows that the negative coefficient for firm age indicates that an increase in firm age will result in a lower estimated probability of a higher degree of CEO board involvement. However, the significance of firm age squared indicates this relationship is non-linear. The estimated positive sign for firm age squared indicates that once a firm reaches a certain age, firm age will have a positive impact on the probability of a higher degree of CEO board involvement. These relationships are also observed in Table 29. The coefficients for firm age indicate that as firm age increases, the probability of CEOs off the board increases by 0.9 percentage-point, the probability of CEOs on the board as directors decreases by 0.8 percentage-point and the probability of CEOs chairing the board decreases by 0.1 percentage-point. The coefficients for firm age squared suggest that the positive contribution to the probability of CEOs off the board diminishes as firm age continues to increase. The turning point is 45 ($\frac{-(\text{coefficient on the number of years listed})}{2 * \text{the number of years listed squared}}$) years. Similarly, the coefficient for firm age squared in column (2) suggest that the negative effect of firm age on the probability of CEOs on the board as directors is mitigated when firm age increases to 40 years and the coefficient for firm age squared in column (3) suggest that the negative effect of the probability of CEO duality is mitigated when firm age increases to 36 years.

These results may suggest that when firms' information environment is relatively less complex (below the threshold values), they may lose less from the information transfer costs and benefit more from the effective monitoring derived from less CEO board involvement. This leads to a higher probability of a lesser degree of CEO board involvement. As firm age continues to grow (above the threshold values), firms' information environment becomes more complex. Any additional increase in the degree of information opacity causes firms to prefer a higher degree of CEO board involvement. On the other hand, CEOs may also

Table 29 Impacts of Explanatory Variables on CEO Board Involvement for Model 5

This table reports the marginal effects of the explanatory variables at the means based on Model (5) in Table 27 on the extent of CEO board involvement. The marginal effects are calculated as the derivatives of the probability of falling in each of three degrees of board involvement with respect to the estimated coefficients of each explanatory variables. ***, **, * denotes significance at the 0.01, 0.05, 0.1 level.

$\frac{\delta \text{Probability of falling in each category}}{\delta \text{respective explanatory variables}}$	CEO off Board	CEO-Director	CEO-Chair
	(1)	(2)	(3)
Ln Sales	-0.021	0.019	0.002
Number of Business Units	-0.036	0.032	0.004
Number of Location Units	-0.075	0.067	0.007
Firm Age	0.009^{**}	-0.008^{**}	-0.001^{**}
Tobin's Q Ratio	-0.038	0.034	0.004
Board Size	-0.053	0.048	0.005
Percentage of Independent Directors	-0.011^{**}	0.010^{**}	0.001
Multiple Directorships (Independent)	0.008^{***}	-0.007^{***}	-0.001^{**}
Board Ownership(%)	0.003	-0.002	-0.0003
Block Shareholding(%)	-0.005	0.004	0.0005
Quadratic Effects			
Number of Business Units	0.005	-0.005	-0.001
Number of Location Units	0.014	-0.013	-0.001
Firm Age	-0.001^{***}	0.0001^{***}	$1.23e-05^{**}$
Tobin's Q Ratio	0.004	-0.004	-0.0004
Board Size	0.003	-0.003	-0.0003
Percentage of Independent Directors	0.0001^{***}	-0.0001^{***}	-0.0001^{*}
Multiple Directorships (Independent)	$-4.2e-05^{***}$	$3.78e-05^{***}$	$4.13e-06^{**}$
Board Ownership(%)	-0.000	0.00001	1.12e-06
Block Shareholding(%)	0.000	-0.00006	-6.33e-06

benefit more from a more opaque information environment, resulting in a higher probability of CEO board involvement.

The results from Table 28 show a positive sign for Tobin's Q ratio, which indicates that increases in growth opportunities will result in a higher probability of a higher degree of CEO board involvement. The coefficient for Tobin's Q ratio squared is negative and statistically significant, indicating that the positive effect may be diminished as Tobin's Q ratio continues to increase. However, the results from Table 29 fail to find any statistical significance of these relationships.

The coefficients on the percentage of independent directors on the board and its squared term from Table 28 indicate that CEOs are more likely to be more involved on the board when the board is relatively less independent whereas CEOs are less likely to be more involved on the board when the board is more independent. The estimation results from Table 29 provide more economic meanings. In more detail, the probability of CEOs off the board decreases by 1.1 percentage-points when the percentage of independent directors increases by 1 percentage-point and the negative relationship turns positive when board independence exceeds 55%. Moreover, the positive effect of independent directors on the probability of CEOs on the board as directors turns negative when board independence is greater than 50% and the positive effect of independent directors on the probability of CEO duality also turns negative when a board has at least 50% independent directors. These results suggest that when board independence is less than the threshold, an increase in board independence is associated with a greater probability of a higher degree of CEO board involvement, suggesting that shareholder interests dominate CEO board involvement decision. However, the relationship reverses as the board becomes majority-independent or supermajority-independent. Specifically, when more than 55% of the board is occupied with independent directors, an increase in board independence is associated with a higher probability of CEOs off the board and when more than 50% of the board are independent directors, an increases in board independence is associated with a lower probability of a higher degree of CEO board involvement. This may be because CEOs may be more reluctant to have a greater involvement on the board with the presence of majority-independent board because of the scrutiny they may experience by serving on the board and this relationship provides evidence for CEO-interests dominant decision.

One implication of such a non-linear relationship is that independent directors may be effective monitors when they only have less than half of the board representation, but

are less effective monitors when they become majority or super-majority on the board. One possible explanation for this is that as the board is dominated by independent directors, their monitoring of the CEO is less effective due to the lack of knowledge of the firm. Past evidence shows that a majority independent board or a supermajority-independent board may not be a good monitor of CEOs. Instead, they may be detrimental to shareholders. For example, Geddes and Vinod (1998) find a curvilinear relationship between CEO tenure and proportion of independent directors. They find a significantly positive coefficient on the proportion of independent directors squared, implying that highly independent boards are less likely to replace CEOs. Bhagat and Black (2002) find that firms with a supermajority-independent board may perform worse. This evidence suggests that independent directors on a supermajority-independent board may not serve as a monitoring device, which decreases the probability of more CEO board involvement. Given the monitoring function of the independent directors decreases in a majority and supermajority-independent board, it is sensible that CEO-interests become the dominant driving force in determining CEO board involvement decision.

Table 28 presents a negative relationship between multiple directorships (independent) and the degrees of CEO board involvement, suggesting that CEOs are likely to have a lesser degree of board involvement in the presence of directors with more outside board appointments. However, the relationship turns positive as the board seats held by directors increase. To be more specific, when the board holds less than 95 additional board seats, an additional increase in board seats held by the board increases the probability of CEOs off the board by 0.8 percentage point whereas when the board holds more than 95 additional board seats, an additional increase in board seats held by the board decreases this probability by 0.0084 percentage point. Furthermore, when the board holds less than 93 extra board seats, an increase in additional board seats decreases the probability of CEOs on the board. However, as the extra board seats further increase, this negative effect is mitigated. The same relationship also holds for the probability of CEO duality only the threshold number of board seats is 121.

These results may suggest the possibility that the number of board seats in independent companies can proxy for different attributes of the board of directors when reaching a certain threshold. Specifically, if total board seats in independent companies is less than

the threshold value, this variable can be a proxy for board ability. In this case, CEOs are less likely to be more involved on the board in a stronger governance environment, implying a CEO-driven outcome. When the total board seats in independent companies is greater than the threshold value, it turns to proxy for board busyness because holding such a large number of directorships may dilute directors' ability to perform their duties. Then, the positive relationship suggests CEOs are more likely to be involved in a higher degree of CEO board involvement in a weaker governance environment. Again, this coincides with the CEO utility maximization argument.

Chapter 6

Analysis of Firm Performance of CEO Board Membership

6.1 Introduction

The purpose of this chapter is to examine the impact of CEO board membership on firm performance in NZ publicly-listed firms. The analysis aims to answer two questions. First, are firms with CEOs on the board associated with higher or lower firm performance? Second, does the association between CEO board membership and firm performance reflect shareholder value maximization or managerial utility maximization?

Since the analysis from Chapter 5 provides evidence that CEO utility has at least a partial impact on the choice of the observed CEO board membership, an obvious question of interest is whether CEO board membership has adverse consequences for firm performance. CEO board membership creates an environment for opportunistic behaviors, such as manipulation of project selection and productivity of investments, which may have a direct negative impact on firms' operating performance. Moreover, such agency costs resulting from agency conflicts can affect investors' ability to predict firms' future cashflow, which may also affect stock market returns. The rest of this chapter is devoted to examining these issues.

6.2 Model Specification, Methodology, and Measurement of Variables

6.2.1 Model Specification and Methodology

To investigate the association between CEO board membership and firm performance, I simply regress firm performance variables on CEO board membership, along with other standard economic determinant variables. The following model is then established:

$$\text{Firm Performance}_{i,t} = \beta_0 + \beta_1 \text{CEO Board Membership}_{i,t} + \beta_2 X_{i,t} + \mu_{i,t} \tag{6.1}$$

where *Firm Performance* includes both accounting-based and market-based measures. Accounting-based measures include ROA and ROE; the market-based measure is Jensen's alpha. *CEO Board Membership* is a dummy variable that takes the value of one if the CEO sits on his or her company board and zero otherwise, and $X_{i,t}$ is a set of exogenous observable standard economic determinants of firm performance. $B = [\beta_0, \beta_1, B_2]$ is a vector of parameters to be estimated, and $\mu_{i,t}$ is an error term.

Return on Assets (ROA) and Return on Equity (ROE)

ROA is a widely used measure of firms' accounting performance. It is an indication of the net income the management has generated given the resources (total assets) available. Core et al. (2006) claim that ROA has more desirable distributional properties than ROE (eg., total assets are always positive whereas equity can be negative or zero).

ROE is also a widely used measure of companies' accounting profitability. The difference between ROA and ROE is the use of liabilities. ROE only calculates return against owners' equity and it ignores how well a company uses other forms of financing, such as borrowing and bonds. A company may produce an impressive ROE without actually being effective at using shareholders' equity to grow the company. Since ROA includes both liabilities and equity in its denominator, it helps to show how well a company puts both forms of financing to use. Both measures of firm performance together provide a clear picture of management's effectiveness.

Control Variables for ROA and ROE

Many factors can potentially affect firms' operating profits, such as ROA and ROE. Sharma and Kesner (1996) and Mitchell et al. (1994) discuss the effect of firm size on business survival and variance in operating performance. They argue that larger firms tend to have a greater competitive advantage than smaller firms because they are more likely to achieve economies of scales than their counterparts and have more resources to survive economic downturns. Firm size is also the most commonly included explanatory variable for operating performance analysis in the prior literature (eg, Chen et al., 2008, Yermack, 1996, Coles et al., 2008, Bhagat and Bolton, 2009, Balsam and Upadhyay, 2009, Elsayed, 2007). I use firms' net sales and market capitalization as proxies for firm size.

In addition, the use of external debt is also an important factor. First, mathematically speaking, interest expenses which are incurred due to external debt reduce net profits and thus have an effect on ROA and ROE ratios. Second, there are two different economic reasons for the effects of outside debt on firm performance in the corporate governance literature. Jensen and Meckling (1976) stipulate that higher leverage improves firm performance through lowering agency costs. Managers tend to maximize their own wealth rather than that of the firms', hence they may have incentives to undertake investments with excessive risks as a part of risk shifting investment strategies through the discretion of free cashflows. Given that creditors expect to receive interest payment and initial investment at the end, they have incentives to monitor. Hence, leverage can be used as a monitoring device to reduce the squander of free cash flows (Jensen and Meckling, 1976), exert pressure to generate cash flows to service debt (Jensen, 1986), or impose liquidation threat (Grossman and Hart, 1982). From this perspective, outside debt has a positive effect on firm performance. On the other hand, the presence of leverage may mitigate "overinvestment", but also introduce "underinvestment" or debt "overhang" problems (Myers, 1977, Jensen, 1986, Stulz, 1990). Specifically, debt holders may help to avoid investments with negative net present values, but may also force managers to pass on some projects with positive net present values. In this case, the effect of debt on firm performance will depend on which effect dominates. Stulz (1990) argues that both effects are present in all firms, with the net effect being an empirical question.

In addition, both ROA and ROE can be largely affected by industry types. For

example, companies in capital intensive industries are likely to have lower ROAs whereas companies in service industries may have higher ROAs. To control for such industry effects, industry dummies are included as control variables in the analysis.

Similarly, year dummies are included to control for some common external economic conditions. For example, during recessionary period all firms may experience revenues decline and uncertain cashflow whereas interest payments remain fixed. During this period of time, it is harder to acquire additional financing because of less deposits in the banks (people have less money and are less willing to invest in the banks) and greater risks of bankruptcy. Hence, firms may forgo some investment projects with positive net present value, which decreases firm value. The reverse is also true for expansionary period.

Jensen's Alpha

An inclusion of a market-based measure in this study reflects the debate surrounding the best measure of firm performance. A market-based proxy for performance suffers from at least two drawbacks. First, the expected performance may have already been reflected in the beginning stock price, hence the market-based measure may not accurately reflect firm performance over the year. Second, it may not have a true reflection of how well firms are being operated because they are subject to external events that are outside the control of CEOs. On the other hand, unlike accounting-based measures, CEOs and other executives have less opportunity to manipulate market-based measures through accounting rules.

I use Jensen's alpha from the capital asset pricing model (CAPM) as the proxy for the market-based measure. The CAPM (Sharpe, 1964, Lintner, 1965a,b) is a single index model, which suggests that the difference in expected returns can be entirely explained by the difference in the systematic risk or "beta".[1] The CAPM takes the following general form:

[1]Nartea et al. (2009) compare the performance of the Fama-French (FF) Three Factor Model (Fama and French, 1992, 1993) with the CAMP in explaining the cross-sectional difference of NZ stock returns. They find that although there is an increase in explanatory power provided by the FF model over the CAPM, the improvement of the magnitudes is smaller than those reported in US and other international studies. In addition, the FF model is unable to explain the strong momentum effect in the NZ stock market as it leaves a large part of the variation in the stock returns unexplained. Due to the above reasons, I use the CAPM over the FF model in explaining the stock returns.

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t}) + \varepsilon_{i,t} \tag{6.2}$$

where $R_{i,t}$ is one-period rate of return of the stock, $R_{f,t}$ is the risk-free rate and $R_{m,t}$ is the return of the whole stock market. β_i measures the slope for the excess market return factor of a stock, and α_i, the intercept, measures the abnormal return (excess return) of the stock after controlling for the market factor.[2] A positive α_i indicates a higher return after adjusting for the market risk whereas a negative α_i indicates a lower return after adjusting for the risk. In other word, α_i is the risk-adjusted return and the part of the return that is unexplained by the market risk.

For the purpose of this analysis, I first use monthly returns to calculate the β for each firm and then by assuming that β remains constant over the sample period, I then obtain the αs using $[(R_{i,t} - R_{f,t}) - \beta_i(R_{m,t} - R_{f,t})]$.[3]

Note that since CEO board membership status and other characteristics variables are observable to the shareholders at the beginning of a period, firm performance may have already reflected their expectation in the beginning share price. Hence, the lagged value of CEO board membership and the lagged values of the other explanatory variables are used in the study when the dependent variable is Jensen's alpha unless stated otherwise.

Control Variables for Jensen's Alpha

Two fundamental anomalies for stock returns are size effect and value effect and I use them

[2]Jensen's alpha: a well-specified asset pricing model assumes the intercept is indifferent from zero in the time-series regressions (eg., Harris and Ravenscraft (1991), Mikkelson and Partch (1986)). However, Jensen (1968) argues that portfolio managers may increase returns on the portfolios through successful prediction of future security prices. In other words, the intercept (alpha) in assets pricing model can be different from zero.

[3]There are different applications of the CAPM model in empirical studies. Black and Jensen (1972) prefer a constant beta approach, which implies the betas for portfolios are constant over the full sample period. Fama and MacBeth (1973), on the other hand, argue that betas are non-stationary. The t-statistics are biased upward under constant beta assumption. Some academic researchers have the preference of using the simpler approach of assuming a constant beta for each portfolio (eg.,Campbell and Ammer (1993), Bekaert et al. (2010) and Baele et al. (2010)). Although there are validities for time variation in betas, I limit the complexity of the model by assuming constant betas.

as control variables. Banz (1981) finds firms with lower market capitalization tend to have higher average returns. Dowen and Bauman (1986) also find that companies with smallest market capitalizations outperform the whole sample portfolio and CRSP value-weighted index in 10 of the 14 years studied. Some more recent examples that find significant relationships between firm size and average stock returns include Kothari et al. (1995), Kim (1997) and Ang et al. (2006).

Apart from market capitalization, market-to-book equity ratios are also found important in explaining cross-sectional differences in average stock returns. As suggested by Fama and French (1995), market-to-book equity ratio indicates whether the firm is overvalued or undervalued. A company with a low market-to-book ratio compared to other similar companies is considered a value stock and a company with a high market-to-book equity ratio is considered a growth stock. Fama and French (1995) argue that market-to-book equity ratio reflects firms' earning potential and thus is associated with long-term differences in profitability. Stattman (1980) and Rosenberg et al. (1998) document that stocks with low market-to-book ratios have higher average returns than that are predicted by market beta alone. Chan et al. (1991) find a strong relationship between market-to-book ratio and average stock return for Japanese stocks and similarly, Capaul et al. (1993) document a similar relationship in four European stock markets and in the Japanese stock market.

6.2.2 Identification of Variables and Measurement of Variables

Variables in implementing equation (6.1) are mostly discussed in Section 5.2. Next, I provide the descriptive statistics for annual excess stock return ($R_{i,t} - R_{f,t}$), annual excess market return ($R_{m,t} - R_{f,t}$), Jensen's alpha, and market-to-book ratio.

Excess Share Return

Excess share return is calculated as the share return minus the risk-free interest rate. I use 1-year government bond yield as a proxy for risk-free interest rate and it can be downloaded from the Reserve Bank of New Zealand website.[4] After adjusting for the risk-free interest rate, the summary statistics for excess stock returns appear in Table 30.

[4]see http://www.rbnz.govt.nz/statistics/exandint/b2/download.html

Table 30 Summary Statistics of Excess Stock Returns

This table reports the summary statistics of excess stock returns between 1997 and 2008. It is calculated by the difference between the stock return and the risk-free interest rate and the risk-free interest rate is downloaded from the Reserve Bank of New Zealand website. The figures are expressed in percentages (%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	23.33	4.58	104.60	805.71	-68.14
1998	79	-28.40	-27.38	29.38	46.61	-89.92
1999	76	37.27	19.36	121.85	1019.91	-47.39
2000	76	20.72	-2.18	97.11	562.70	-97.17
2001	81	-0.02	-5.89	54.00	234.59	-91.70
2002	78	6.12	7.38	42.63	224. 58	-86.16
2003	77	6.56	4.41	43.73	174.89	-86.89
2004	76	32.32	22.56	60.56	290.78	-63.01
2005	74	7.89	4.18	43.57	219.26	-87.04
2006	82	0.80	-2.64	33.58	143.11	-65.23
2007	79	12.53	6.29	44.69	225.68	-83.51
2008	81	-28.89	-29.92	32.74	77.46	-100.83
All Year	931	7.07	-1.68	67.96	1019.91	-100.83
Jarque-Bera	2.6e+05					
Summary Statistics of Excess Stock Returns after Winsorization						
All Years	931	2.36	-1.68	38.16	81.71	-60.74
Jarque-Bera	31.8					

Excess Market Return

Excess market return is calculated as the market return minus the risk-free interest rate. I use the returns on the All Ordinaries Index as a proxy for market returns. The index is downloaded from the NZX Company Research under Indices. The market return is simply

the percentage change in index between two points in time.

Table 31 Summary Statistics of Market Returns

This table reports the summary statistics of market returns between 1997 and 2008. It is calculated by the percentage change in index on the balance dates and the index is downloaded from the NZX ALL index from the NZX Company Research. The figures are reported in percentages (%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	19.74	25.31	9.68	27.92	2.91
1998	81	-10.70	-17.65	10.95	6.36	-28.97
1999	76	16.98	19.82	8.56	31.25	2.36
2000	81	1.44	4.38	9.03	6.49	-31.79
2001	87	6.35	6.68	5.12	16.71	-2.25
2002	82	9.30	8.40	3.85	26.50	3.39
2003	84	12.41	13.09	8.55	26.50	-0.24
2004	82	27.24	26.08	4.60	34.64	20.73
2005	81	19.51	20.73	4.31	33.42	8.96
2006	85	11.21	7.50	5.98	24.00	1.71
2007	80	15.35	19.21	6.46	23.85	-0.29
2008	81	-22.66	-24.70	5.79	-11.18	-33.74
All Year	972	8.72	8.95	15.11	34.64	-33.74
Jarque-Bera	118.9					

Table 31 reports the average of annual returns on the NZX All Ordinary Index ending at various balance dates between 1997 and 2008. From the table, it can be seen that there is no particular trend with respect to the means and medians and the figures vary significantly from year to year. After adjusting for the risk-free interest rates, the summary statistics for excess market return appear in Table 32.

Table 32 Summary Statistics of Excess Market Returns

This table reports the summary statistics of excess market returns between 1997 and 2008. It is calculated as market return minus 1-year government bond yield and the results are expressed in percentages (%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	12.49	18.01	10.12	21.14	-5.09
1998	81	-18.19	-25.98	10.93	-2.32	-35.00
1999	76	12.19	15.41	8.31	26.15	-2.03
2000	81	-5.35	-2.58	8.90	-0.30	-38.20
2001	87	0.83	1.00	5.37	11.97	-7.66
2002	82	3.78	2.61	4.02	21.01	-2.34
2003	84	7.27	8.24	8.58	21.01	-5.69
2004	82	21.36	19.80	4.82	29.26	14.41
2005	81	13.08	14.41	4.44	27.09	2.14
2006	85	4.38	0.61	6.06	17.18	-5.30
2007	80	8.02	11.89	6.41	17.28	-7.81
2008	81	-29.38	-31.73	5.18	-18.70	-38.26
All Year	972	2.43	2.74	15.38	29.26	-38.26
Jarque-Bera	116.4					

Jensen's Alpha

Table 33 reports the summary statistics of Jensen's alpha between 1997 and 2008. It is calculated by $[(R_{i,t} - R_{f,t}) - \beta_i(R_{m,t} - R_{f,t})]$ after estimating β from equation (6.2). The table shows that alphas, after adjusting for market risk factors, have an overall mean of 0.7 and a median of -2.84.

Market-to-Book Ratio

Market-to-book equity ratio is the ratio of market value of the company over book value of the company. The market value of the company refers to the market capitalization of

Table 33 Summary Statistics of Jensen's Alpha

This table shows the summary statistics of Jensen's alpha, calculated using $[(R_{i,t} - R_{f,t}) - \beta_i(R_{m,t} - R_{f,t})]$ after estimating β from equation (6.2) , between 1997 and 2008. The values are expressed in percentages (%).

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	71	0.81	-3.65	32.89	83.98	-60.20
1998	78	-11.91	-12.95	24.19	54.09	-61.59
1999	75	13.08	9.18	36.02	79.29	-53.28
2000	76	10.42	-0.04	37.93	107.72	-59.40
2001	80	-3.10	-4.69	43.87	81.34	-77.34
2002	76	0.53	2.92	32.61	78.25	-54.55
2003	76	0.01	3.04	36.71	72.31	-85.68
2004	74	6.59	5.39	38.21	75.18	-90.91
2005	72	-5.21	-5.29	33.92	76.28	-62.29
2006	80	-3.08	-6.52	31.43	81.65	-62.46
2007	76	5.01	1.92	34.00	88.89	-58.80
2008	78	-3.91	-10.19	26.17	80.40	-49.12
All Year	912	0.70	-2.84	34.83	107.72	-90.91
Jarque-Bera	19.99					

the company (number of shares outstanding multiplied by share price) and it focuses on the value the market places on the firm whereas the book value of the company refers to the amount that is left after paying off its liabilities. Hence, the market-to-book ratio is calculated using the following formula,

$$\text{Market-to-Book Ratio} = \frac{\text{Market Capitalization}}{\text{Total Equity}} \tag{6.3}$$

Table 34 provides the summary statistics of the market-to-book ratio for the firms in my sample. It shows that the market-to-book ratio has been fluctuating between 1997 and 2000, and then there is an increasing trend from 2001 to 2007. This ratio dropped

significantly in 2008. There is a wide range between the maximum value of 315.34 and the minimum value of -213.54 in 2006. The maximum value is due to additional shares issued by Lombard Group Limited, resulting in a large capitalization. The minimum value occurs for Training Solutions Plus Limited. This miserable figure is a result of a combination of the significant share issuing and negative equity. After a 5% winsorization, the mean decreases slightly and the median remains unchanged. However, the JB statistic decreases significantly, suggesting that the sample is closer to a normal distribution after the winsorisation. Compared to NZ firms, US firms have slightly higher market-to-book ratios. For example, Bhagat and Bolton (2009) report an average market-to-book ratio of 2.684 between 1998 and 2007.

6.3 Preliminary Data Analysis

Preliminary data analysis is carried out to compare the means and the medians of performance measures between firms with CEOs on the board and those with CEOs off the board. T-tests and Wilcoxon tests are performed to justify the significance of differences in the means and the medians, respectively. These parametric and non-parametric tests are used to provide some preliminary evidence of the relationship between CEO board membership and firm performance. The sample size in each category of firms is reported in the parentheses next to the firm performance measures. The results of this exercise are reported in Table 35.

Table 35 shows that contrary to predictions based on the managerial utility argument, firms with CEOs on the board perform better than firms with CEOs off the board in both measures of operating firm performance. In terms of Jensen's alpha, there is no evidence of statistical difference between firms with CEOs off the board and those with CEOs on the board. The insignificant results for the difference in share returns may suggest that investors are well aware of the agency costs associated with CEO board membership and this information has been fully impounded in the beginning stock prices, making CEO board membership have no impact on stock returns after adjusting market risk factors and shareholders indifferent between these two types of firms.

Although Table 35 shows firms with CEOs on the board have better accounting per-

Table 34 Summary Statistics of Market-to-Book Ratio

This table reports the summary statistics of companies' market-to-book value from 1997 to 2008. It is calculated by firms' market capitalization over firms' book value, or equivalently,

$$\text{Market-to-Book Ratio} = \frac{\text{Market Capitalization}}{\text{Total Equity}} \tag{6.4}$$

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	71	1.94	1.40	1.46	7.32	0.29
1998	80	1.66	1.14	1.84	14.09	0.29
1999	76	1.91	1.13	2.09	13.36	0.26
2000	81	2.67	1.44	3.70	25.26	0.18
2001	85	1.84	1.35	5.09	19.08	-33.42
2002	79	2.15	1.56	2.28	13.61	-3.25
2003	77	2.38	1.53	3.30	27.25	0.24
2004	77	2.59	1.87	2.28	14.68	0.36
2005	76	2.84	2.15	2.33	10.43	0.02
2006	85	3.74	1.88	41.55	315.34	-213.54
2007	80	4.60	2.00	13.82	118.18	-3.51
2008	81	1.88	1.37	1.53	8.15	0.30
All Year	948	2.53	1.52	3.58	315.34	-213.54
Jarque-Bera	6.4e+06					
Summary Statistics of Market-to-Book Ratio after Winsorization						
All Years	948	2.24	1.52	2.03	9.59	0.33
Jarque-Bera	1,326					

formance, the results should be interpreted with caution because the simple comparisons of the means and the medians between the two groups of firms do not control for other factors that are correlated with CEO board membership, which may also have effects on firm performance. The relationship shown in Table 35 may be contaminated by such fac-

Table 35 Summary Statistics of Firm Performance

This table reports the summary statistics of firm performances for firms with CEOs on the board and those with CEOs off the board. Specifically, the means and medians of ROA, ROE, alphas are provided for both groups of firms. The sample size in each category of firms is reported in the parentheses. T test and Wilcoxon test are performed to compare the means and medians between the two groups. Standard deviations are reported in the parentheses under the means. Levels of significance are indicated by ***,**,* for 1%, 5% and 10% respectively.

	CEOs off the Board		CEOs on the Board			
	Mean	Median	Mean	Median	T test	Wilcoxon test
ROA(277,685)	-1.15	4.42	1.49	4.84	**	*
	(20.05)		(17.29)			
ROE(277,685)	-5.25	7.58	2.17	10.14	***	***
	(46.34)		(40.22)			
Jensen's Alpha(248, 664)	0.97	-1.38	0.60	-2.99		
	(2.14)		(1.37)			

tors. In order to examine this possibility, I produce correlation matrices of the explanatory variables for each firm performance measure, CEO board membership dummy variable and determinant factors identified in Section 6.2.1 to explain firm performance.

Table 36, Table 37 and Table 38 show the correlation matrices of firm performance variables and the identified determinant variables. The tables show that the results obtained from Table 35 may be spurious, particularly with regard to the operating performance measures. For example, Table 36 and Table 37 reveal that real sales are positively related to CEO board membership and ROA/ROE. Without holding real sales constant, it may attribute the effect on firm performance to CEO board membership, rather than real sales. Similarly, market-to-book equity ratio is negatively correlated with Jensen's alpha in Table 38. In order to obtain a clear relationship between CEO board membership and Jensen's alpha, the effect of market-to-book equity ratio should be isolated. In order to

Table 36 Cross-Correlation Table for ROA

This table reports the correlation matrix of variables for ROA, CEO board membership, firm size variables and debt ratio. Levels of significance are indicated by $***$, $**$, $*$ for 0.1%, 1% and 5%, respectively.

Variables	ROA	CEO Board Membership	Real Sales	Real Market Capitalization	Debt Ratio
ROA	1.00				
CEO Board Membership	0.07*	1.00			
Real Sales	0.13***	0.10***	1.00		
Real Market Capitalization	0.18***	0.01	0.76***	1.00	
Debt Ratio	-0.03	0.08**	0.24***	0.12***	1.00

Table 37 Cross-Correlation Table for ROE

This table reports the correlation matrix of variables for ROE, CEO board membership, firm size variables and debt ratio. Levels of significance are indicated by $***$, $**$, $*$ for 0.1%, 1% and 5%, respectively.

Variables	ROE	CEO Board Membership	Real Sales	Real Market Capitalization	Debt Ratio
ROE	1.00				
CEO Board Membership	0.08*	1.00			
Real Sales	0.12***	0.10***	1.00		
Real Market Capitalization	0.17***	0.01	0.76***	1.00	
Debt Ratio	−0.07*	0.08*	0.24***	0.12***	1.00

Table 38 Cross-Correlation Table for Jensen's Alpha

This table reports the correlation matrix of variables for share returns, excess share returns, CEO board membership, market capitalization and market-to-book equity ratio. Levels of significance are indicated by $***$, $**$, $*$ for 0.1%, 1% and 5%, respectively.

Variables	Jensen's Alpha	Lag CEO Board Membership	Lag Real Market Capitalization	Lag Market-to-Book
Jensen's Alpha	1.00			
Lag CEO Board Membership	-0.02	1.00		
Lag Real Market Capitalization	-0.04	0.00	1.00	
Lag Market-to-Book Ratio	−0.14***	0.10***	0.23***	1.00

disentangle such relationships, I run regression models that control for different attributes that may have an impact on firm performance, thus providing an isolated effect of CEO board membership on firm performance.

6.4 Regression Analysis and Discussion of Results

6.4.1 Basic Regression Analysis

This section presents the results of the regressions to examine the association between CEO board membership and firm performance variables using equation (6.1). All the regression results are estimated by using feasible generalized least squares which allows estimation in the presence of heteroskedasticity across panels of firm data and panel-specific AR (1) autocorrelation.[5] The results of this exercise for ROA appears in Table 39.

Column (1) of Table 39 reports the estimation results when CEO board membership is included as the only explanatory variable after controlling for industry and year effects. The result shows that a CEO on the board is associated with 3.72 percentage points increase in ROA. Column (2) and (3) include firm size, proxied by the natural log of real sales and real market capitalization, as the additional explanatory variables. After controlling for firm size, CEO-on-the-board firms outperform CEO-off-the-board firms by 2.03 (2.20) percentage points in terms of ROAs. The relationship does not change when debt ratio is used as an additional explanatory variable. Columns (5) and (6) present the regression results when both firm size and debt ratio are included. Overall, the models provide consistent results that firms with CEOs on the board have higher ROAs than firms with CEOs off the board. In other words, the benefits of CEOs on the board outweigh

[5]Each of the models reported was fitted using an ordinary least squares (OLS) estimation, incorporating a robust error variance-covariance matrix by relaxing the assumption of independence between firms. The models are estimated using the 'xtgls' command in the Stata software package. The models are fitted with 'heteroskedasitic but uncorrelated' for error structure across firms and 'panel-specific AR(1)' for autocorrelation across years of firm data. The adjusted R^2 reported in the tables are based on the squared correlation between the actual and predicted dependent variables. The reason of reporting R^2 this way is because all the models use an iterated generalised least squares estimation procedure, and Stata does not report the traditional R^2 for such procedure.

Table 39 Regression Results of ROA on CEO Board Membership

This table reports the results for equation (6.1). The dependent variable, ROA, is regressed on CEO board membership dummy, firm size, debt ratio, industry and year dummies. Terms in parentheses are standard errors estimated based on OLS regression while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	2.99***	−24.11***	−28.55***	6.73***	−19.54***	−23.55***
	(0.53)	(2.40)	(2.12)	(0.88)	(2.17)	(2.30)
CEO Board Membership	3.72***	2.03***	2.20***	3.09***	2.23***	2.65***
	(0.49)	(0.51)	(0.56)	(0.57)	(0.50)	(0.55)
ln Sales		2.22***			2.39***	
		(0.18)			(0.19)	
ln Market Capitalization			2.89***			2.80***
			(0.18)			(0.19)
Debt Ratio(%)				−0.11***	−0.14***	−0.10***
				(0.01)	(0.01)	(0.01)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943	943
Adjusted R^2	0.24	0.35	0.32	0.24	0.38	0.34

the associated costs for firms with CEOs on the board or the costs of CEOs on the board outweigh the associated benefits for firms with CEOs off the board, providing evidence for shareholder value maximization.

Furthermore, the estimation results show that firm size is positively related to ROAs across all the models and the results are statistically significant. Specifically, ROA increases by 2.22 (column(2)) and 2.39 (column(5)) percentage points for every 1% increase

in real sales and 2.89 (column(3)) and 2.80 (column(6)) percentage points for every 1% increase in market capitalization. The positive relationship between firm size and ROAs may be because larger firms have greater economies of scales, which helps to achieve greater efficiency, resulting in improved firm performance. Debt ratio, on the other hand, is negatively related to ROAs across the models. This is consistent with the view of Myers (1977), Jensen (1986) and Stulz (1990) that outside debt may introduce "underinvestment" problem, which contributes negatively to firm performance.

Moreover, I conduct a joint test for the industry dummies and a separate test for joint analysis of the year dummies. Both results show statistical significance at the 1% level, suggesting that industry and year effects play significant roles in explaining the difference in ROAs.

Table 40 reports the regression results of the association between CEO board membership and ROE while controlling for firm size, debt ratio, industry effects and year effects. The results show that CEO board membership is positively associated with ROEs and the results are statistically significant using different model specifications. Again, the results provide evidence that the benefits of CEO board membership are larger than the associated costs for firms with CEOs on the board, hence are consistent with the shareholder value maximization argument. Similar to the analysis for ROA, firm size is positively related to ROEs across all the models and debt ratios, on the other hand, are negatively associated with ROEs.

Table 41 reports the regression results of alpha on CEO board membership and other determinant variables that are used to explain the cross-sectional difference in share returns while controlling for industry effects and year effects. Column (1) presents the regression results when only the lagged CEO board membership is included in the model and it shows that the coefficient for CEO board membership is positive and statistically significant at the 10% level. Column (2) presents the results when the lagged market capitalization is included as an additional explanatory variable. Again, it shows that CEOs on the board contributes positively to excess share returns after the market systematic risk has been controlled for and this association is statistically significant at the 5% level. In addition, consistent with Banz (1981) and Dowen and Bauman (1986), excess stock returns on small firms are higher than those on large firms after controlling for market systematic risk.

Table 40 Regression Results of ROE on CEO Board Membership

This table reports the estimation results for equation (6.1). The dependent variable, ROE, is regressed on CEO board membership dummy, firm size and debt ratio. Terms in parentheses are standard errors estimated based on OLS regression while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	1.73	-75.27^{***}	-67.84^{***}	3.99^{**}	-62.65^{***}	-56.12^{***}
	(1.48)	(3.85)	(5.06)	(1.71)	(4.20)	(4.18)
CEO Board Membership	6.35^{***}	6.46^{***}	6.31^{***}	8.52^{***}	9.59^{***}	8.67^{***}
	(1.15)	(1.24)	(1.31)	(1.27)	(1.05)	(1.42)
ln Sales		6.20^{***}			6.28^{***}	
		(0.26)			(0.36)	
ln Market Capitalization			6.11^{***}			6.09^{***}
			(0.41)			(0.39)
Debt Ratio(%)				-0.23^{***}	-0.31^{***}	-0.20^{***}
				(0.02)	(0.02)	(0.02)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943	943
Adjusted R^2	0.12	0.22	0.22	0.15	0.27	0.25

Column (3) uses lagged market-to-book ratio as an additional explanatory variable. As expected, firms with higher market-to-book ratio are associated with lower alpha, indicating that value stocks outperform growth stocks. Column (4) provides the results for the full model. The results are similar to the ones estimated separately, except that the coefficient for the lagged value of market capitalization loses significance.

Table 41 Regression Results of Alpha on CEO Board Membership

This table reports the results for equation (6.1). The dependent variable is alpha and is regressed on the lagged CEO board membership dummy, lagged market capitalization and lagged market-to-book ratio. Terms in parentheses are standard errors estimated based on the OLS regression while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)
Intercept	-7.60^{***}	3.62	$-3,62^{*}$	-0.09
	(1.61)	(5.32)	(1.87)	(4.42)
Lagged CEO Board Membership	2.30^{*}	3.08^{**}	2.82^{**}	3.07^{***}
	(1.27)	(1.25)	(1.18)	(1.12)
Lagged ln Market Capitalization		-1.04^{***}		-0.36
		(0.31)		(0.26)
Lagged Market-to-Book Ratio			-2.12^{***}	-2.02^{***}
			(0.43)	(0.44)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
No. of Observations	743	743	731	731
Adjusted R^2	0.09	0.09	0.09	0.09

Summary

To sum up, the regression results for the relationship between CEO board membership and firm performance provide consistent evidence for shareholder value maximization. Specifically, CEO board membership is positively related to firm performance variables and the results are statistically significant across all the models. Moreover, firm size contributes positively to firms' operating performance, but negatively to Jensen's alpha. Debt ratio has a negative impact on firms' operating performance and market-to-book ratio also has a negative impact on firms' alpha after controlling for the market risk.

6.4.2 Robustness Checks

This section provides two additional analyses to check the robustness of the results obtained in Section 6.4.1.

CEO Board Membership, Firm Performance, and Self-Selection

This section aims to examine whether the positive relationship between CEO board membership and firm performance found in Section 6.4.1 can be explained by firms' or CEOs' self-selection bias. To explain this concept clearer, I first discuss the econometrics of self-selection.

The Econometrics of Self-Selection

Heckman (1974) first addressed the problem of self-selection by examining the average wage of a married woman. The issue is that the wages of married women are only observable for working women and housewives are excluded (Heckman, 1974, 1979). However, whether a married woman is in the labor force is not generated randomly, but is an outcome of the competition between a housewife's reservation wage (or the minimum wage rate at which a housewife might accept an employment in the market place) and the market wage. A woman participates in the labor force if the market offers a higher wage than the reservation wage, and does not participate otherwise. Hence, we only observe the wages of women who participate in the labor force, and we have no observations for women not in the labor force. The usual OLS estimator from a regression estimating the average wage of married women is biased and inconsistent.

Heckman (1974, 1978, 1979) developed a sample selection model, which was designed to handle models with limited dependent variables (or truncated data in the above example). In other words, the sample selection model deals with models with a dependent variable, which is only observable for a subset of a population. The implementation of the standard Heckman procedure involves two equations: (1) the outcome equation including the variables determining the outcome, and (2) the selection equation including a subset of a population whose outcomes are observed and variables determining the selection

process.[6]

Maddala (1983) later extended Heckman's sample selection model to allow for the evaluation of treatment effectiveness. Although both models share common characteristics and thus can be regarded as Heckman-type models (Guo and Fraser, 2010), they differ in a major way. While the sample selection model handles models with outcomes only observable for a subgroup of a population, the treatment effect model deals with the problem when outcomes of the whole population are observed. A classic example of the treatment effect model is the wages of union members. The wages of union members and non-union members are both observable. However, the problem of estimating the effect of unionization on wages by a regression of wages on the personal characteristics of workers plus a dummy variables representing workers' union status is that a worker's union status is endogenous, not exogenous. In fact, many factors affecting workers' decision to join the union may affect their wages. For example, if less able workers are more likely to join a union and receive lower wages as a result, then a failure to control for this correlation will yield an OLS estimated union effect on wages that is biased down. This is the exact same problem in my model. Recall that,

$$C_{i,t} = \alpha_0 + \alpha_1 \text{Information Opacity}_{i,t} + \alpha_2 \text{Governance Strength}_{i,t} + \varepsilon_{i,t} \quad (6.5)$$

$$P_{i,t} = \beta_0 + \beta_1 * C_{i,t} + \beta_2 * X_{i,t} + \mu_{i,t} \quad (6.6)$$

where $C_{i,t}$ equals 1 if the CEO of firm i is on the board at period t and zero otherwise. $P_{i,t}$ is the performance of firm i at period t.

If some unobserved firm and CEO characteristics simultaneously have effects on CEO board membership decision and firm performance, $C_{i,t}$ and $\mu_{i,t}$ will be correlated. Specifically, if the variables included in the model are not sufficient in describing firms' information opacity and governance strength, these omitted variables are likely to be captured by the error term in equation (6.5). If these omitted variables also affect firm performance, the error terms will be correlated, which leads to a correlation between $C_{i,t}$ and $\mu_{i,t}$, then this model is characterized by endogeneity . The OLS estimate of the endogenous variable will

[6]See Heckman (1978, 1979) for a more detailed estimation procedure of the standard Heckman sample selection model.

be biased and inconsistent.

Intuitively, if some firm and CEO attributes are useful in explaining the cross-sectional differences in the CEO board membership decision and firm performance simultaneously, then not taking their effects on CEO board participation into account will result in attributing their impacts on firm performance to CEO board membership, rather than to these underlying attributes. The failure to control for this correlation will yield an estimated CEO board membership effect on firm performance that is biased and therefore contaminate the true relationship between CEO board membership and firm performance. A control of these characteristics, on the other hand, isolates the impact of CEO board membership on firm performance.

Put it into the context of the positive relationship found in Section 6.4.1, the unobserved characteristics which cause the CEO to sit on the board may create desirable conditions for firm performance. For example, more capable CEOs are more likely to take greater responsibilities, such as by serving on the board, and these capable CEOs are more likely to generate higher firm performance. Without controlling for these unobserved underlying characteristics which makes CEOs on the board more likely, the positive effect may be wrongly attributed to CEO board membership, rather than CEO abilities.

To investigate this possibility, I employ the treatment effect model based on Heckman (1979)'s two-step procedure. The basic idea of the treatment effect model is as follows:

When CEO board membership takes the value of one, the expected value of firm performance in equation (6.6) becomes:

$$E(P_{i,t}|C_{i,t} = 1) = \beta_0 + \beta_1 + \beta_2 * X_{i,t} + E(\mu_{i,t}|C_{i,t} = 1) \tag{6.7}$$

If the errors in equations (6.5) and (6.6) follows a bivariate normal distribution with a mean of zero, a standard deviation of σ_μ, and with correlation ρ, then,

$$E(\mu_{i,t}|C_{i,t} = 1) = \rho\sigma_\mu\lambda_1(\alpha Z_{i,t}) \tag{6.8}$$

where $\alpha Z_{i,t}$ is the estimated component of CEO board membership attributable to firms' information opacity and governance strength in equation (6.5), and

$$\lambda_1(\alpha Z_{i,t}) = \frac{\phi(\alpha Z_{i,t})}{\Phi(\alpha Z_{i,t})} \tag{6.9}$$

and ϕ and Φ are the density and cumulative distribution functions of the standard normal.

Similarly, when CEO board membership takes the value of zero, the expected value of firm performance becomes:

$$E(P_{i,t}|C_{i,t} = 0) = \beta_0 + \beta_2 * X_{i,t} + E(\mu_{i,t}|C_{i,t} = 0) \tag{6.10}$$

In this case,

$$E(\mu_{i,t}|C_{i,t} = 0) = \rho\sigma_\mu\lambda_2(\alpha Z_{i,t}) \tag{6.11}$$

where

$$\lambda_2(\alpha Z_{i,t}) = \frac{-\phi(\alpha Z_{i,t})}{1 - \Phi(\alpha Z_{i,t})} \tag{6.12}$$

Thus, the difference in performance between firms with CEOs on the board and those with CEOs off the board is:

$$E(P_{i,t}|C_{i,t} = 1) - E(P_{i,t}|C_{i,t} = 0) = \beta_1 + \rho\sigma_\mu\frac{\phi(\alpha Z_{i,t})}{\Phi(\alpha Z_{i,t})(1 - \Phi(\alpha Z_{i,t}))} \tag{6.13}$$

The right hand side of equation (6.13) is the OLS estimate of β_1 in equation (6.6). It shows explicitly that the OLS estimate will be biased if ρ (the correlation between the error terms in equations (6.6) and (6.5)) is not equal to zero. Specifically, the OLS estimate of β_1 is biased down if ρ is negative and the OLS estimate of β_1 is biased up if ρ is positive.

The specific procedure of implementing the treatment effect model involves two steps. The first step is to estimate equation (6.5) using the probit model to get estimates of αs. These estimates are then used to compute λ_1 and λ_2. The second step is to estimate

$$\begin{aligned} \mathrm{P}_{i,t} &= \beta_0 + \beta_1 * C_{i,t} + \beta_2 * X_{i,t} + \rho\sigma_\mu[\lambda_1(\alpha Z_{i,t}) * C_{i,t} + \lambda_2(\alpha Z_{i,t}) * (1 - C_{i,t})] + \eta_{i,t} \\ &= \beta_0 + \beta_1 * C_{i,t} + \beta_2 * X_{i,t} + \beta_\lambda\lambda + \eta_{i,t} \end{aligned} \tag{6.14}$$

where $\beta_\lambda = \rho\sigma_\mu$ and λ is the inverse Mills ratio, or the self-selection parameter. If β_λ, the coefficient of the selectivity correction term is significant, it indicates the existence of self-selection. In other words, the second step is to estimate equation (6.6) but augmenting the self-selection parameter.[7]

[7]The validity of this procedure depends on the quality of instruments used to calculate the self-selection parameter where the instruments are the exogenous variables in equation (6.5).

The treatment effect model, extended from the Heckman self-selection model, is frequently used in corporate finance research. For example, Campa and Kedia (2002) used the treatment effect model to examine the diversification discount. They find that the characteristics that make firms to diversify are negatively associated with firm value. After accounting for this selection effect, there is no diversification discount. In fact, diversified firms traded at a premium relatively to the value had they not diversified. A more related area of research is the effect of CEO duality on firm performance. Using the treatment effect model, Chen et al. (2008) find the evidence that firms self-select into a board leadership structure to optimize firm performance.

Discussion of Regression Results

This section discusses the regression results of the effect of CEO board membership on firm performance using the treatment effect model.

Table 42 reports the estimation results of the relationship between CEO board membership and ROA/ROE with the inclusion of the inverse Mills ratio. Columns (1) and (2) report the regression results when ROA is used as the dependent variable while columns (3) and (4) report the estimation outputs when ROE is used as the dependent variable.

In column (1), the inverse Mills ratio is positive and statistically significant and in column (2), it is statistically insignificant. The significant coefficient indicates the prevalence of self-selection and suggests that characteristics that make firms to have CEOs on the board are positively correlated with ROAs. The fact that the coefficient for the inverse Mills ratio being statistically significant at the 1% level suggests that self-selection is potentially important in explaining the relationship between CEO board membership and ROAs. Indeed, this has a significant effect on the estimated coefficient for CEO board membership. Specifically, the coefficients for CEO board membership become -0.65 in column (1) and -0.94 in column (2) with no statistical significance, compared with the original values of 2.23 and 2.65 (from Table 39), respectively with statistical significance at the 1% level. Hence, after taking into account the positive effects of these underlying variables that make the benefits greater than the costs, there is no statistically significant relationship between CEO board membership and ROAs, suggesting firms make CEO board membership decision optimally.

Table 42 Regression Results of Operating Firm Performance on CEO Board Membership with Self-Selection Bias

This table reports the results for equation (6.1). The dependent variables is ROA and ROE, respectively. All models include the inverse Mills ratio to account for the possibility for self-selection bias. Terms in parentheses are standard errors estimated based on firm-level clustering. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	ROA		ROE	
	(1)	(2)	(3)	(4)
Intercept	-23.00^{***}	-24.65^{***}	-50.01^{***}	-62.31^{***}
	(2.73)	(2.57)	(5.96)	(6.24)
CEO Board Membership	-0.65	-0.94	4.89	3.86
	(1.37)	(1.45)	(3.46)	(3.62)
Inverse Mills Ratio	1.94^{***}	0.90	2.07	-0.42
	(0.69)	(0.77)	(1.56)	(1.78)
ln Sales	2.66^{***}		5.25^{***}	
	(0.23)		(0.46)	
ln Market Capitalization		3.03^{***}		6.44^{***}
		(0.22)		(0.50)
Debt Ratio(%)	-0.11^{***}	-0.07^{***}	-0.22^{***}	-0.12^{***}
	(0.01)	(0.01)	(0.02)	(0.03)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
No. of Observations	829	829	829	829
Adjusted R^2	0.35	0.30	0.22	0.20

Column (3) and (4) present the estimation results when ROE is used as the dependent variable. The results show that although the coefficients for the inverse Mills ratio are statistically insignificant, they have a significant effect on the estimated coefficient for CEO board membership. In detail, the coefficients for CEO board membership become 4.89 and

3.86, respectively and are not statistically significant. These are significant reductions from the original values of 9.59 and 8.67 (from Table 40) with 1% level statistical significance. Hence, after taking self-selection effects into consideration, CEO board membership has no statistically significant relationship with ROEs. Again, the results provide evidence of firms' optimal decision-making regarding the CEO board membership decision.

Table 43 Regression Results of Alpha on CEO Board Membership with Self-Selection Bias

This table reports the results for equation (6.1). The dependent variable is alpha and is regressed on lagged CEO board membership dummy, lagged market capitalization and lagged market-to-book ratio while accounting for the lagged self-selection bias. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

Intercept	0.61
	(8.09)
Lagged CEO Board Membership	15.31***
	(5.07)
Lagged Inverse Mills Ratio	−6.99***
	(2.91)
Lagged ln Market Capitalization	-0.92
	(0.61)
Lagged Market-to-Book Ratio	−2.13***
	(0.47)
Year Dummies	Yes
Industry Dummies	Yes
No. of Observations	650
Adjusted R^2	0.09

Table 43 presents the estimation results of Jensen's alpha on lagged CEO board membership and lagged control variables while taking into account the possible self-selection bias. The coefficient for the inverse Mills ratio is negative and statistically significant at the 1% level. This suggests that characteristics that make CEOs on the board more likely are negatively perceived by stock market participants. In other words, it is not a shareholder value maximizing strategy to have CEOs on the board given the characteristics.

The negative self-selection effect may be due to one of the following two possibilities: (1) for some reason, firms may choose to have the CEO on the board even at the expense of a reduction in the market-based performance; (2) by manipulating some of the underlying characteristics, CEOs sit on the board to obtain greater private benefits. Such firms may be discounted by shareholders because of the agency costs. After isolating this negative effect, the coefficient for lagged CEO board membership is not only positive and statistically significant, it is also significantly larger than the original value of 3.07 from column (4) of Table 41. Hence, the results from the market-based model find that after controlling for the negative self-selection bias, the benefits of CEOs on the board significantly outweigh the costs in firms with CEO board membership, providing a stronger evidence for the shareholder value maximization argument compared to the basic model.

To sum up, this section repeats the analysis in Section 6.4.1 by incorporating the self-selection bias parameter. The analysis for accounting-based performance measures and market-based measure tell different stories. As for operating performance analysis, after controlling for the self-selection parameter, the positive relationship between CEO board membership and firm performance found in Section 6.4.1 disappears. In addition, the coefficient for the self-selection parameter is positive and statistically significant in one of the models. These results provide weak evidence that after taking self-selection into account, CEO board membership decision is not statistically significantly related to accounting performance. In other words, CEO board membership decision is made optimally given firms' characteristics. On the other hand, after taking into account the negative self-selection, there is an even more positive relationship between CEO board membership and Jensen' alpha, providing evidence for shareholder value maximization.

CEO Board Membership, Firm Performance, and Other Governance Characteristics

This section examines the possibility that the relationship between CEO board membership and firm performance observed in Section 6.4.1 is affected by other governance features, thus resulting in a spurious relationship. A number of studies have examined the links between governance structure and firm performance, with a particular focus on what Gillan (2006) called "internal governance". For example, Yermack (1996) examines the relation-

ship between board size and firm performance while Rosenstein and Wyatt (1990) look into the impact of board independence, in terms of outside directors, on share price reactions. Fich and Shivdasani (2006) suggest that the monitoring function of the board is compromised with the presence of busy directors on the board, hence they are associated with lower firm value; Ferris et al. (2003), on the other hand, find that busy boards do not harm shareholders' interests.

Chapter 5 of this thesis discusses that CEO board membership categorization is influenced by firms' governance environment. If these governance characteristics also impact firm performance, the exclusion of these variables will result in a spurious relationship by attributing the effect to CEO board membership, rather than the excluded governance variables. In order to examine this issue, I re-estimate equation (6.1) by including variables that are used to measure firms' governance environment: board size, percentage of independent directors, board ownership, multiple directorships, and block shareholdings. The results of this exercise appear in Table 44.

Table 44 shows that after controlling for other governance mechanisms, CEO board membership is still positively associated with ROA, ROE and alpha although the magnitudes of the coefficients for CEO board membership are smaller compared to the original values. Indeed, some of these variables are statistically significant in explaining firm performance variables. For example, board ownership is positively associated with ROA and ROE, and board size and percentage of independent directors on the board are negatively associated with alpha.

In addition, I also conduct the joint tests of these governance variables and the chi-squared statistics are reported in the bottom row of Table 44. The statistics are large enough to reject the null hypothesis of joint insignificance, providing further evidence for the significance of these variables.

6.4.3 Additional Analysis

In this section, I include interaction terms between CEO board membership and variables proxying for the opacity of firms' information environment and the strength of firms' governance environment in the analysis. The inclusion of the interaction variables aims to

Table 44 Regression Results of CEO Board Membership, Firm Performance and Other Governance Characteristics

The dependent variables are firm performance measures - ROA, ROE and alpha. All regression include a full set of year dummies (1997 being the omitted year) and industry dummies (industry 1 being the omitted industry type). The explanatory variables for the analysis of alpha are the lagged values of the variables. Terms in parentheses are standard errors based on OLS estimation correcting for heteroskedasticity and autocorrelation. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)
	ROA	ROE	Alpha
Intercept	−25.21***	−57.03***	8.84
	(2.65)	(5.42)	(8.54)
CEO Board Membership	1.63***	6.85***	2.74*
	(0.54)	(1.09)	(1.58)
Ln Sales	2.64***	5.36***	
	(0.18)	(0.39)	
Ln Market Capitalization			-0.42
			(0.63)
Market-to-Book Ratio			−2.06***
			(0.45)
Board Size	0.07	0.52*	−0.01***
	(0.12)	(0.29)	(0.52)
Percentage of Independent Directors(%)	0.01	0.01	−0.09***
	(0.01)	(0.03)	(0.03)
Block Shareholdings(%)	0.02	0.04	-0.02
	(0.01)	(0.03)	(0.04)
Board Ownership(%)	0.03***	0.05***	-0.06
	(0.01)	(0.02)	(0.04)
Multiple Directorships(Independent)	-0.01	-0.02	0.02
	(0.01)	(0.02)	(0.02)
Debt Ratio(%)	−0.14***	−0.26***	
	(0.01)	(0.02)	
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
No. of Observations	905	905	699
Adjusted R^2	0.35	0.23	0.09
Chi-squared for the joint test on governance variables	26.38	17.61	10.52
	(0.000)	(0.00)	(0.06)

examine how the relationships between CEO board membership and firm performance measures are affected by the opacity of firms' information environment and the strength of firms' governance environment.

Given that CEO board membership is positively associated with ROA, ROE and Jensen's alpha, as revealed in Tables 39, 40 and 41, when the estimated coefficients for the interactions between CEO board membership and the opacity of firms' information environment are positive, for example, it indicates that a more opaque information environment exacerbate the positive relationship between CEO board membership and firm performance measures. This provides evidence for the shareholder value maximization argument because it is consistent with the expectation that CEO board membership has a larger effect on firm performance in a more opaque information environment due to the information transfer efficiency. On the other hand, when the coefficients for the interactions are negative, it means that a more opaque information environment mitigates the positive relationship between CEO board membership and firm performance. Due to the potential entrenchment behavior in such an environment, this is evidence for the managerial utility maximization argument. The coefficients for the interactions between CEO board membership and the strength of firms' governance environment are expected to be positive. In other words, a stronger governance environment is expected to intensify the positive relationship between CEO board membership and firm performance. The model specification of this exercise takes the following general form:

$$\begin{aligned}\text{Firm Performance}_{i,t} =& \beta_0 + \beta_1 \text{CEO Board Membership}_{i,t} + \beta_2 \text{Information Opacity}_{i,t}/ \\ & \text{Governance Strength}_{i,t} + \beta_3 \text{Information Opacity}_{i,t}/ \\ & \text{Governance Strength}_{i,t} * \text{CEO Board Membership}_{i,t}\end{aligned} \tag{6.15}$$

Variable definitions are the same as those for equation (6.1) except that *information opacity* and *governance strength* are variables proxying for the opacity of information environment and the strength of governance environment where these variables take the value of 1 if the variables in question are above the sample medians and zero otherwise. The sum of the

coefficients, for instance, on CEO board membership and information opacity*CEO board membership, would represent the impact of CEO board membership on firm performance in firms with variables proxying the information opacity above the sample medians whereas the coefficient on CEO board membership represents the effect of CEO board membership on firm performance in firms with the information opacity variables below the median values. Hence, the coefficients for the interactions signal the additional contribution or penalty of CEO board membership to firm performance in firms with a more opaque information environment and a stronger governance environment. The rest of this section is devoted to this exercise.

Table 45 Regression Results of ROA on CEO Board Membership with Interaction Terms

This table reports the estimation results for equation (6.15). The dependent variable is ROA. Natural log of market capitalization, number of business units, number of location units, firm age, Tobin's Q ratio, board size, percentage of independent directors, board ownership, multiple directorships and block shareholding are indicator variables that take a value of 1 if these variables are greater than the respective median values in sample, otherwise zero. All the regressions include year dummy variables and industry dummy variables. Terms in parentheses are standard errors estimated based on OLS regression while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Panel A: Information Opacity					
Intercept	4.22**	−25.64***	−22.22***	−26.24***	−21.02***
	(0.90)	(2.31)	(1.94)	(2.18)	(1.86)
CEO Board Membership	3.18***	3.93***	2.26***	3.73***	0.29
	(0.73)	(0.69)	(1.27)	(0.63)	(0.67)
LnMarket Capitalization*CEO Board Membership	-0.69				
	(0.96)				
Number of Business Units*CEO Board Membership		−5.38**			
		(1.07)			
Number of Location Units*CEO Board Membership			-1.39		
			(1.00)		
Firm Age*CEO Board Membership				−3.19***	
				(0.85)	
Tobin's Q Ratio*CEO Board Membership					3.57***
					(0.63)
Number of Business Units		3.49***			
		(0.96)			
Number of Location Units			3.13***		
			(1.01)		
Firm Age				3.00***	

Continued on next page

Table 45 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
				(0.67)	
Tobin's Q Ratio					-0.21
					(0.53)
Ln Market Capitalization	5.63***	2.94***	2.73***	2.97***	2.65***
	(0.86)	(0.20)	(0.19)	(0.18)	(0.17)
Debt Ratio(%)	−0.11***	−0.11***	−0.12***	−0.10***	−0.09***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943
Adjusted R^2	0.29	0.33	0.34	0.33	0.34
Panel B: Governance Strength					
Intercept	24.68***	−24.96***	25.62***	−22.87***	−30.77***
	(2.36)	(2.29)	(2.42)	(2.25)	(1.99)
CEO Board Membership	3.90***	2.87***	1.01	1.84***	4.60***
	(0.64)	(0.70)	(0.72)	(0.62)	(0.74)
Board Size*CEO Board Membership	−2.38***				
	(0.71)				
Percentage of Independent Directors*CEO Board Membership		-0.99			
		(0.76)			
Board Ownership*CEO Board Membership			−2.11***		
			(0.59)		
Multiple Directorships (Independent Companies)*CEO Board Membership				1.35*	
				(0.70)	
Block Shareholding*CEO Board Membership					−4.13***
					(1.01)
Board Size	1.03*				

Continued on next page

Table 45 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
	(0.59)				
Percentage of Independent Directors		-0.90			
		(0.68)			
Board Ownership			3.71***		
			(0.76)		
Multiple Directorships (Independent Companies)				−1.72***	
				(0.57)	
Block Shareholding					4.25***
					(0.93)
Ln Market Capitalization	2.81***	3.00***	3.02***	2.83***	3.23***
	(0.20)	(0.19)	(0.20)	(0.20)	(0.18)
Debt Ratio(%)	−0.10***	−0.11***	−0.10***	−0.11***	−0.11***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943
Adjusted R^2	0.33	0.33	0.33	0.33	0.34

Table 45 presents the regression results of ROAs on CEO board membership dummy, interactions between CEO board membership and the opacity of firms' information environment variables and the strength of governance environment variables while firm size and debt ratio are controlled for.[8] Panel A shows the regression results when variables proxying for firms' information opacity are interacted with CEO board membership dummy. Column (1) shows that for small firms the effect of CEO board membership is positive and statistically significant whereas the coefficient for the interaction term is negative and statistically insignificant, indicating that the effect of CEO board membership on ROAs is indifferent between small firms and large firms. The sum of the coefficients for CEO board membership and the interaction term is positive, which is consistent with the results obtained in Table 39.

Column (2) presents the regression results when the interaction between CEO board membership and the number of business units is included in the model. The coefficient for CEO board membership is positive and statistically significant, indicating that for less complex firms, the effect of CEO board membership is positive. The coefficient for the interaction term is negative and statistically significant, suggesting that the incremental effect of business units on the relationship between CEO board membership and ROAs is negative. More importantly, the sum of the coefficient is also negative, indicating a penalty for firms with more business units (ie., more opaque information environment) to adopt the CEOs-on-the-board structure. This is consistent with the managerial utility maximization argument.

Column (3) shows the estimation output when the interaction between CEO board membership and the number of location units is included. Although the coefficient for CEO board membership is positive and statistically significant, the coefficient for the interaction term is insignificant. Consequently the sum of the coefficients is positive, indicating a benefit to have CEOs on the board regardless of the number of location units.

Column (4) reports the regression output when the partition is based on firm age. We observe a positive and significant coefficient on CEO board membership for firms with age below the median, and a negative coefficient for the interaction between CEO board membership and firm age. The sum of the coefficients is lower than the coefficient for CEO

[8]When firm size is used as the control variable, it is a continuous variable.

board membership, indicating a cost to have the CEO on the board when firm age is above its median value. This, again, provides evidence for the managerial utility argument.

The results from column (5) suggest that despite the effect of CEO board membership is indifferent from zero when firms' growth opportunities are few, the effect of CEO board membership is positive and statistically significant in firms with more growth opportunities. This means the benefits of CEO board membership increase with the increase in growth opportunities, providing evidence for shareholder value maximization when making CEO board membership decision in a more opaque information environment.

Panel B presents the estimation outputs of ROAs on CEO board membership dummy and the interactions between the strength of firms' governance environment and CEO board membership dummy. From column (1), the positive and statistically significant coefficient on CEO board membership indicates that CEO board membership contributes positively to ROAs in firms with smaller boards, indicating a benefit to have CEOs on the board in these circumstances. However, the coefficient on the interaction term is negative and significant, suggesting that the benefit of having CEOs on the board decreases with increases in board size.

Column (2) incorporates the partitions based upon percentage of independent directors. The coefficient for CEO board membership is positive and statistically significant for firms where percentage of independent directors is below the median, and the coefficient for the interaction is negative and insignificant. This indicates that percentage of independent directors does not play a key role in determining the relationship between CEO board membership and ROAs.

Contrary to expectation, column (3) shows that the coefficient for the interaction term is negative and statistically significant, indicating that the effect of greater board ownership mitigates the relationship between CEO board membership and ROAs.

Similarly, column (4) shows the coefficient for the interaction term is positive and significant, indicating that the benefit of CEO board membership increases with the number of multiple directorships in independent companies. Contrary to expectation, the estimation results from column (5) show that the effect of CEO board membership on ROAs is greater in firms with less block shareholding than those with more block shareholding although the overall effect is still positive.

Table 46 Regression Results of ROE on CEO Board Membership with Interaction Terms

This table reports the estimation results for equation (6.15). The dependent variable is ROE. Natural log of market capitalization, number of business units, number of location units, firm age, Tobin's Q ratio, board size, percentage of independent directors, board ownership, multiple directorships and block shareholding are indicator variables that take a value of 1 if these variables are greater than the respective median values in sample, otherwise zero. All the regressions include year dummy variables and industry dummy variables. Terms in parentheses are standard errors estimated based on OLS regression while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Panel A: Information Opacity					
Intercept	7.42***	−60.04***	−54.25***	−62.57***	−55.16***
	(2.53)	(4.89)	(4.15)	(4.50)	(4.80)
CEO Board Membership	4.19*	10.09***	9.92***	9.60***	1.61
	(2.23)	(1.78)	(1.95)	(1.85)	(1.65)
LnMarket Capitalization*CEO Board Membership	4.51*				
	(2.51)				
Number of Business Units*CEO Board Membership		−8.06**			
		(2.51)			
Number of Location Units*CEO Board Membership			−4.35*		
			(2.45)		
Firm Age*CEO Board Membership				-2.28	
				(2.24)	
Tobin's Q Ratio*CEO Board Membership					10.91***
					(1.60)
Number of Business Units		5.30***			
		(2.29)			
Number of Location Units			4.45*		
			(2.43)		
Firm Age				1.61	

Continued on next page

Table 46 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
				(1.87)	
Tobin's Q Ratio					-1.24
					(1.26)
Ln Market Capitalization	7.09***	6.17***	6.03***	6.65***	5.94***
	(2.19)	(0.43)	(0.41)	(0.39)	(0.39)
Debt Ratio(%)	−0.19***	−0.19***	−0.22***	−0.18***	−0.20***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943
Adjusted R^2	0.29	0.24	0.24	0.24	0.24
Panel B: Governance Strength					
Intercept	−56.32***	−62.53***	−66.73***	−53.95***	6.54
	(4.40)	(4.24)	(5.41)	(4.37)	(9.82)
CEO Board Membership	9.92***	12.39***	3.93**	6.88***	-3.81
	(1.77)	(1.64)	(1.70)	(1.59)	(3.11)
Board Size*CEO Board Membership	−3.54***				
	(1.88)				
Percentage of Independent Directors*CEO Board Membership		−6.63***			
		(2.05)			
Board Ownership*CEO Board Membership			6.70***		
			(1.72)		
Multiple Directorships (Independent Companies)*CEO Board Membership				2.04	
				(1.95)	
Block Shareholding*CEO Board Membership					13.04***
					(4.84)
Board Size	3.19*				

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Table 46 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
	(1.74)				
Percentage of Independent Directors		0.20			
		(1.89)			
Board Ownership			-0.72		
			(1.29)		
Multiple Directorships (Independent Companies)				-2.74^{***}	
				(1.64)	
Block Shareholding					18.79^{***}
					(2.30)
Ln Market Capitalization	6.09^{***}	6.40^{***}	6.86^{***}	6.19^{***}	7.34^{***}
	(0.41)	(0.40)	(0.46)	(0.43)	(0.39)
Debt Ratio(%)	-0.22^{***}	-0.21^{***}	-0.20^{***}	-0.22^{***}	-0.23^{***}
	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943
Adjusted R^2	0.24	0.23	0.25	0.24	0.25

Panel A of Table 46 reports the regression results of ROEs on CEO board membership dummy variable and the interactions between CEO board membership dummy and variables proxying for the opacity of firms' information environment variables. The coefficient on the interaction between CEO board membership and firm size from column (1) and the coefficient for the interaction between CEO board membership and Tobin's Q ratio from column (5) are positive and statistically significant, indicating that firms with CEOs on the board benefit more from a more opaque information environment compared with a less opaque information environment. This provides evidence for the shareholder value maximization argument. On the other hand, the coefficient for the interaction between CEO board membership and the number of business units from column (2) and the coefficient for the interaction between CEO board membership and the number of location units from column (3) are negative and statistically significant, suggesting that firms with CEOs on the board experience greater costs in a more complex (more opaque) environment than a less complex information environment. Although the overall effects are still positive, these provide evidence of a violation of shareholder value maximization and the presence of managerial utility maximization.

Panel B of Table 46 reports the regression results of ROEs on CEO board membership dummy variable and the interaction terms between CEO board membership and governance strength variables. The coefficient for the interaction between CEO board membership and board size from column (1) is negative and statistically significant and the coefficients for the interaction of CEO board membership with board ownership (column (3)) and with block shareholding (column (5)) are positive and statistically significant. These results suggest that in a stronger governance environment, the benefits of having CEOs on the board increase. However, the interaction term between CEO board membership and percentage of independent directors (column (2)) is negative and statistically significant, indicating that the costs of CEO board membership increases in firms with more independent directors.

Table 47 Regression Results of Alpha on CEO Board Membership with Interaction Terms

This table reports the estimation results for equation (6.15). The dependent variable is alpha, calculated from equation (6.15). Natural log of market capitalization, number of business units, number of location units, firm age, Tobin's Q ratio, board size, percentage of independent directors, board ownership, multiple directorships and block shareholding are indicator variables that take a value of 1 if these variables are greater than the respective median values in sample, otherwise zero. All the regressions include year dummy variables and industry dummy variables. Terms in parentheses are standard errors estimated based on OLS regression while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Panel A: Information Opacity					
Intercept	-3.32	-2.14	-0.50	-3.24	6.54
	(2.74)	(9.85)	(5.07)	(5.00)	(9.82)
Lagged CEO Board Membership	3.26	4.32	5.10**	6.55***	-3.81
	(2.42)	(3.06)	(2.15)	(2.15)	(3.11)
Lagged LnMarket Capitalization*CEO Board Membership	1.13				
	(2.83)				
Lagged Number of Business Units*CEO Board Membership		−9.00*			
		(5.35)			
Lagged Number of Location Units*CEO Board Membership			-2.91		
			(2.84)		
Lagged Firm Age*CEO Board Membership				−6.60***	
				(2.55)	
Lagged Tobin's Q Ratio*CEO Board Membership					13.04***
					(4.84)
Lagged Number of Business Units		-0.06			
		(4.60)			
Lagged Number of Location Units			4.63*		
			(2.64)		
Lagged Firm Age				6.20**	

Continued on next page

Table 47 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
				(2.42)	
Lagged Tobin's Q Ratio					−10.73**
					(4.57)
Lagged Ln Market Capitalization	-1.45	-0.06	-0.56	6.65***	-0.59
	(2.58)	(0.75)	(0.43)	(0.39)	(0.73)
Lagged Market-to-Book Ratio	−2.08***	−2.66***	−1.87***	−1.96***	−1.92***
	(0.43)	(0.60)	(0.44)	(0.44)	(0.64)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	731	731	731	731	731
Adjusted R^2	0.09	0.11	0.09	0.09	0.11
Panel B: Governance Strength					
Intercept	-5.52	4.04	3.51	4.76	1.12
	(4.66)	(4.90)	(4.95)	(5.70)	(6.27)
Lagged CEO Board Membership	7.01***	0.97	0.40	2.76*	3.88
	(1.97)	(2.88)	(1.32)	(1.48)	(3.10)
Lagged Board Size*CEO Board Membership	−10.16***				
	(2.75)				
Lagged Percentage of Independent Directors*CEO Board Membership		1.97			
		(3.40)			
Lagged Board Ownership*CEO Board Membership			6.38		
			(4.06)		
Lagged Multiple Directorships (Independent Companies)*CEO Board Membership				3.68*	
				(1.92)	
Lagged Block Shareholding*CEO Board Membership					-2.71
					(3.41)
Lagged Board Size	6.39*				

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Table 47 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
	(2.41)				
Lagged Percentage of Independent Directors		-3.97			
		(2.80)			
Lagged Board Ownership			−7.07*		
			(3.82)		
Lagged Multiple Directorships (Independent Companies)				-0.92	
				(1.14)	
Lagged Block Shareholding					-0.06
					(3.06)
Lagged Ln Market Capitalization	-0.50	-0.42	-0.33	−0.76***	-0.27
	(0.46)	(0.28)	(0.35)	(0.45)	(0.45)
Lagged Market-to-Book Ratio	−1.99***	−1.97***	−2.03***	−1.92***	−1.98***
	(0.46)	(0.44)	(0.44)	(0.46)	(0.44)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	731	731	731	731	731
Adjusted R^2	0.10	0.09	0.10	0.10	0.10

Panel A of Table 47 reports the regression results of alphas on CEO board membership and interactions with information opacity variables. The results show that the coefficients for the interaction between CEO board membership and the number of business units and the interaction between CEO board membership and firm age are negative and significant, suggesting that firms with CEOs on the board benefit less from a more opaque information environment, as proxied by more business units and older firms, than a less opaque environment. In other words, firms adopting the CEO-on-the-board structure generate less returns in a more opaque information environment. This provides supporting evidence for the managerial utility maximization argument. To the contrary, the coefficient for the interaction between CEO board membership and Tobin's Q ratio is positive and significant, providing evidence for the shareholder value maximization hypothesis.

Panel B presents the regression results of alphas on CEO board membership and interactions with firms' governance environment. The coefficient for the interaction between CEO board membership and board size is negative and significant and the coefficient for the interaction between CEO board membership and multiple directorships is positive and significant. Both coefficients are consistent with the expectation that a stronger governance environment enhances the relationship between CEO board membership and firm performance.

Overall, this section provides mixed evidence for shareholder value maximization and managerial utility maximization. Specifically, the effect of CEO board membership on firm performance is attenuated by the increase in the number of business units, the number of geographic units and firm age, providing evidence for CEO utility maximization whereas the effect of CEO board membership on firm performance is intensified with the increase in growth opportunities, providing evidence for shareholder value maximization. Moreover, the effect of CEO board membership on firm performance is only enhanced with the increase in some selected governance variables, such as board size and multiple directorships. These relationships are consistent with the expectation that a stronger governance environment is associated with a more positive relationship between CEO board membership and firm performance.

6.5 Performance Implications of CEO Board Involvement

This section examines the effects of the different degrees of CEO board involvement on firm performance. Specifically, I divide the group of firms with CEOs on the board into firms with CEOs on the board as directors and CEOs on the board as chairmen. Hence, firms are categorized into three categories: firms with CEOs off the board, firms with CEO-director and firms with CEO duality. Dual CEOs may impose the greatest agency costs since their position combines the management and control roles. Because such a leadership structure represents the highest level of power concentration in a company, as envisaged by the agency theory, CEOs in these firms may have the greatest power in a firm to manipulate corporate behavior and extract rents from shareholders. In other words, self-serving CEOs who also hold the chair position may be detrimental to shareholders' wealth, as reflected in lower firm performance.

In order to test this possibility, I regress firm performance measures on CEO board involvement by allowing for the intercept to reflect the different degrees of CEO board involvement. Specifically, the regression models take the following general form:

$$\begin{aligned}\text{Firm Performance}_{i,t} = \beta_0 + \beta_1 &\text{CEO Board Involvement}_{i,t}^{High} \\ &+ \beta_2 \text{CEO Board Involvement}_{i,t}^{Low} + \beta_3 X_{i,t} + \mu_{i,t}\end{aligned} \tag{6.16}$$

Variables are defined as in equation (6.1), except for *CEO Board Involvement*$_{i,t}^{High}$ takes the value of 1 if the CEO holds the chair role, and 0 otherwise and *CEO Board Involvement*$_{i,t}^{Low}$ takes the value of 1 if the CEO does not sit on the board of directors, and 0 otherwise.

In equation (6.16), β_0 is the component of firm performance unrelated to other standard determinant variables for firms with CEO-director, and β_1 and β_2 are the corresponding incremental impacts of CEO board involvement on firm performance for firms with dual-CEOs and firms with CEOs off the board. These coefficients are of the primary interest.

6.5.1 Basic Regression Analysis

Table 48 reports the estimation results of the effect of CEO board involvement on firm performance measures while controlling for the standard determinants, industry and year effects. The results from columns (1) to (4) show that the estimates of the coefficients for CEO duality and CEO off board are negative and statistically significant at the 1% level. Specifically, after controlling for variation in firm size and debt ratio, firms with dual CEOs are associated with ROAs that are 4.63 (4.98) percentage points lower than that with CEOs who sit only on the board. On the other hand, the coefficient for CEOs off the board shows that CEO-off-the-board firms are associated with ROAs that are 3.11 (3.35) percentage points lower than firms with CEO-directors. Moreover, the reduction in ROA associated with not being on the board at all is slightly lower than that for dual firms. Similar relationships can be also found when the dependent variable is ROE but with greater magnitudes. For example, firms with dual CEOs are associated with ROEs that are 11.97 (13.50) percentage points lower than firms with CEOs on the board only and firms with CEOs off the board are associated with 10.08 (9.05) percentage points lower. The negative coefficients for CEO duality from models (1) to (4) suggest that the costs of CEO duality outweigh the associated benefits in firms with dual CEOs, providing evidence for managerial utility maximization. Similarly, the negative coefficients for CEOs off the board imply that the benefits of CEOs off the board are lower than the costs in firms with CEOs off the board, thus CEOs off the board is also a managerial utility maximization strategy.

The results from model (5) tell a different story - the coefficient for the intercept indicates firms with CEO-director generate alphas that are indifferent from zero, the coefficient for CEO duality is positive and statistically significant and the coefficient for CEO off board is negative and significant. The coefficient for CEO duality means that firms with CEOs taking the dual role are associated with excess share returns that are 6.37 percentage points higher than those of firms with CEOs sitting on the board as a director only, providing evidence for shareholder value maximization; the coefficient for CEO off board indicates that firms with CEOs off the board generate alphas that are lower than firms with CEOs who sit only on the board, providing evidence for managerial utility maximization.

Table 48 Regression Results of Firm Performance on CEO Board Involvement

This table reports the results for equation (6.16). The dependent variables are ROA, ROE and alpha, respectively. The dependent variable is regressed on CEO board involvement dummies, ie., CEO duality and CEOs off the board, and determinant variables. The explanatory variables for column (5) are the lagged values. Terms in parentheses are standard errors estimated based on the OLS regression while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROE	ROE	Alpha
Intercept	-19.03^{***}	-20.00^{***}	-53.75^{***}	-45.56^{***}	1.16
	(2.16)	(2.13)	(4.49)	(4.21)	(4.24)
CEO Duality	-4.63^{***}	-4.98^{***}	-11.97^{***}	-13.50^{***}	6.37^{***}
	(1.01)	(1.00)	(3.44)	(3.35)	(3.60)
CEO off Board	-3.11^{***}	-3.35^{**}	-10.08^{***}	-9.05^{***}	-2.07^{*}
	(0.51)	(0.53)	(1.44)	(1.51)	(0.44)
Ln Sales	2.58^{***}		6.19^{***}		
	(0.18)		(0.36)		
Ln Market Capitalization		2.75^{***}		5.92^{***}	-0.22
		(0.18)		(0.40)	(0.29)
Debt Ratio(%)	-0.15^{***}	-0.10^{***}	-0.19^{***}	-0.19^{***}	
	(0.01)	(0.01)	(0.03)	(0.02)	
Market-to-Book Ratio					-2.03^{***}
					(0.44)
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	813
Adjusted R^2	0.39	0.34	0.27	0.25	0.09

6.5.2 Robustness Checks

CEO Board Involvement, Firm Performance, and Self-Selection

In this section, I examine whether the relationship estimated in Table 48 is biased by the self-selection behavior. For example, firms may choose to have the CEO off the board - for whatever reason - at the expense of a reduction in performance. More convincingly, CEOs may choose to sit off the board to avoid responsibilities and such CEOs are likely to be associated with poor firm performance. In order to test such possibilities, I employ the treatment effect model based on Heckman (1979)'s two-step procedure. That is, in the first stage, I estimate two selection equations for the choice of the degree of CEO board participation (one each for the high- and low-category), and the second stage uses the inverse Mills ratios generated from the first stage models as additional exogenous variables given by equation (6.16). Hence, the models to estimate become:

$$\begin{aligned}\text{Firm Performance}_{i,t} = \beta_0 + \beta_1 \text{CEO Board Involvement}_{i,t}^{High} + \beta_2 \text{CEO Board Involvement}_{i,t}^{Low} \\ + \beta_3 X_{i,t} + \beta_4 \lambda + \beta_5 \gamma + \eta_{i,t}\end{aligned} \tag{6.17}$$

where λ is the selection parameter for CEO duality and γ is the selection parameter for CEOs who are not members of the board. The results of this exercise appear in Table 49.

Overall, Table 49 shows that after controlling for self-selection, dual firms are still associated with lower operating firm performance, providing evidence for CEO utility maximization. However, the negative effect of CEOs off the board on operating performance disappears after controlling for self-selection. In fact, firms with CEOs off the board are associated with accounting performance indifferent to firms with CEO-director. Contrarily, stock market investors find CEO duality indifferent to CEO-director but still respond negatively to CEOs off the board.

Specifically, after allowing for the self-selection bias, the coefficients on CEO duality become more negative compared to the original values in Table 48. In addition, the co-

Table 49 Regression Results of CEO Board Involvement, Firm Performance, and Self-Selection

This table reports the results for equation (6.17) . The dependent variables are ROA, ROE and Jensen's alpha. Terms in parentheses are standard errors and the significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
	ROA	ROA	ROE	ROE	Alpha
Intercept	-24.75^{***}	-25.21^{***}	-49.87^{***}	-61.80^{***}	15.73^{*}
	(2.92)	(2.68)	(5.87)	(5.97)	(8.32)
CEO Duality	-12.50^{***}	-12.98^{***}	-25.84^{***}	-20.96^{**}	-5.01
	(3.30)	(3.56)	(8.28)	(8.62)	(9.05)
CEOs off Board	0.76	1.56	-2.59	-3.84	-17.53^{***}
	(1.37)	(1.53)	(3.28)	(3.69)	(5.37)
Inverse Mills Ratio for CEO Duality	3.21^{*}	3.67^{*}	4.49	3.80	15.14^{***}
	(1.72)	(1.92)	(4.10)	(4.41)	(5.72)
Inverse Mills Ratio for CEO off Board	-2.03^{***}	-1.63^{**}	-5.74^{***}	-0.67	9.51^{***}
	(0.77)	(0.79)	(1.46)	(1.81)	(3.15)
Ln Sales	2.80^{***}		5.71^{***}		
	(0.21)		(0.42)		
Ln Market Capitalization		2.99^{***}		6.74^{***}	-0.98
		(0.21)		(0.45)	(0.61)
Debt Ratio(%)	-0.12^{***}	-0.08^{***}	-0.26^{***}	-0.10^{***}	
	(0.01)	(0.01)	(0.02)	(0.03)	
Market-to-Book Ratio					-2.07^{***}
					(0.48)
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	829	829	829	829	829
Adjusted R^2	0.36	0.31	0.24	0.20	0.10

efficients for the inverse Mills ratio for CEO duality are generally positive and significant (except column (3) and (4)). The positive coefficients for the inverse Mills ratio for CEO duality indicate that firm and CEO characteristics that contribute positively to CEO duality are positively associated with firm performance. Given these relationships, it is not surprising that after taking into account the positive self-selection behavior, the coefficients

for CEO duality become more negative. In other words, self-selection behavior mitigates the CEO effects in determining the choice of CEO duality.

Table 49 shows that opposite to the changes to the dual firms, the negative effect of CEOs off the board on operating performance disappears after the self-selection bias is controlled for. In fact, the coefficients from columns (1) to (4) become indifferent from zero after controlling for the negative self-selection bias, indicating that the accounting performance for firms with CEOs off the board is indifferent from firms with CEO-director. The coefficients of the inverse Mills ratio for CEOs off the board from columns (1) to (4) suggest that firm and CEO characteristics that contribute positively to CEOs off the board have negative impacts on firms' operating performance. However, the results from column (5) indicate the market participants perceive that the variables that contribute positively to CEOs off the board also have a positive impact on firm performance. Therefore, after controlling for this effect, the coefficient for CEOs off the board is more negative compared with the value obtained in Table 48. Thus, self-selection attenuates CEO effects in this case.

CEO Board Involvement, Firm Performance, and Other Governance Characteristics

This section aims to analyze whether the results obtained in Table 48 are affected by the inclusion of other governance variables. The results of this exercise are presented in Table 50.

Table 50 shows that the inclusion of other governance variables mitigates the negative effects of CEO duality and CEOs off the board on ROA and ROE compared to the original values from Table 48. However, the coefficients for both groups of firms become statistically insignificant when the dependent variable is Jensen's alpha. The changes in the magnitudes and significance of the coefficients indicate that other governance variables play a part in the relationship between the different degrees of CEO board involvement and firm performance, particularly when firm performance is market-based. In fact, the coefficients for the percentage of independent directors, block shareholding, and board ownership are statistically significant in the models. In addition, the joint test on the governance variables indicates at least 3% significance level.

Table 50 Regression Results of CEO Board Involvement, Firm Performance and Other Governance Characteristics

The dependent variables is firm performance measures - ROA, ROE and Jensen's alpha. All regression include a full set of year dummies (1997 being the omitted year) and industry dummies (industry 1 being the omitted industry type). The explanatory variables for the analysis of alpha are the lagged values of the variables. Terms in parentheses are standard errors based on OLS estimation correcting for heteroskedasticity and autocorrelation. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)
	ROA	ROE	Alpha
Intercept	-23.01^{***}	-48.03^{***}	11.34
	(2.45)	(4.96)	(8.41)
CEO Duality	-4.23^{***}	-11.14^{***}	4.88
	(1.12)	(3.28)	(4.04)
CEO off Board	-2.67^{***}	-9.30^{***}	-1.92
	(0.44)	(1.11)	(1.60)
Ln Sales	2.61^{***}	5.26^{***}	
	(0.18)	(0.40)	
Ln Market Capitalization			-0.36
			(0.64)
Market-to-Book Ratio			-2.03^{***}
			(0.47)
Board Size	0.06	0.24	0.05
	(0.11)	(0.29)	(0.54)
Percentage of Independent Directors(%)	0.03^{**}	0.02	-0.10^{***}
	(0.01)	(0.03)	(0.03)
Block Shareholdings(%)	0.02^{*}	0.05^{**}	-0.03
	(0.01)	(0.03)	(0.04)
Board Ownership(%)	0.03^{***}	0.04^{**}	-0.07^{*}
	(0.01)	(0.02)	(0.04)
Multiple Directorships(Independent)	-0.01	0.01	0.01
	(0.01)	(0.02)	(0.02)
Debt Ratio(%)	-0.14^{***}	-0.25^{***}	
	(0.01)	(0.03)	
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
No. of Observations	905	905	699
Adjusted R^2	0.36	0.24	0.09
Chi-squared for the joint test on governance variables	35.37	13.92	12.15
	(0.00)	(0.02)	(0.03)

6.5.3 Additional Analysis

The purpose of this section is to investigate the possibility that the effects of the different degrees of CEO board involvement on firm performance differ when the degrees of opacity of firms' information environment and strength of governance environment differ. To examine this issue, I regress firm performance measures on information opacity and governance strength variables and allow for different intercepts and slope coefficients reflecting the extent of CEO involvement. Hence, the regression model takes the following general form:

$$\begin{aligned}\text{Firm Performance}_{i,t} = \beta_0 &+ \beta_1 \text{CEO Board Involvement}_{i,t}^{High} + \beta_2 \text{CEO Board Involvement}_{i,t}^{Low} \\ &+ \beta_3 \text{Information Opacity/Governance Strength}_{i,t} \\ &+ \beta_4 \text{CEO Board Involvement}_{i,t}^{High} * \text{Information Opacity/Governance Strength} \\ &+ \beta_5 \text{CEO Board Involvement}_{i,t}^{Low} * \text{Information Opacity/Governance Strength} \\ &+ \beta_6 X_{i,t} + \eta_{i,t}\end{aligned} \tag{6.18}$$

In equation (6.18), β_0 is the component of firm performance that is unrelated to the variable in question for firms with CEO-director, β_3 is the component of firm performance attributable to the variable in question for the same group of firms; β_1 is the incremental effect that is unrelated to the variable in question on firm performance for firms with information opacity/governance strength variables below their median values and with dual CEOs where β_2 represents the same effect for firms with CEOs off the board; β_4 is the incremental effect on firm performance that is attributable to the variables in question for firms with information opacity/governance strength variables above their median values and with dual CEOs whereas β_5 represents the same effect for firms with CEOs off the board.

Table 51 Regression Results of ROA on CEO Board Involvement with Interaction Terms

This table reports the estimation results for equation (6.18). The dependent variable is ROA. Natural log of market capitalization, number of business units, number of location units, firm age, Tobin's Q ratio, board size, percentage of independent directors, board ownership, multiple directorships and block shareholding are indicator variables that take a value of 1 if these variables are greater than the respective median values in the sample, otherwise zero. All the regressions include year dummy variables and industry dummy variables. Terms in parentheses are standard errors estimated based on the OLS regressions while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Panel A: Information Opacity					
Intercept	8.02**	−21.14***	−219.23***	−22.00***	−20.49***
	(0.52)	(1.91)	(1.78)	(1.98)	(1.54)
CEO Duality	−5.04***	−4.12***	−4.70***	−4.34*	-1.05
	(1.76)	(1.74)	(1.37)	(2.26)	(1.15)
CEO Off Board	−5.50***	−4.32***	−2.84***	−4.36***	-0.46
	(0.68)	(0.65)	(0.62)	(0.58)	(0.67)
LnMarket Capitalization*CEO Duality	0.41				
	(2.07)				
LnMarket Capitalization*CEO off Board	2.44***				
	(0.92)				
Number of Business Units*CEO Duality		1.28			
		(2.14)			
Number of Business Units*CEO off Board		5.51**			
		(1.06)			
Number of Location Units*CEO Duality			1.09		
			(2.37)		
Number of Location Units*CEO off Board			1.16		
			(1.01)		
Firm Age*CEO Board Duality				-1.81	

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Table 51 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
				(2.51)	
Firm Age*CEO off Board				−2.60***	
				(0.84)	
Tobin's Q Ratio*CEO Duality					−9.79***
					(1.83)
Tobin's Q Ratio*CEO off Board					−4.65***
					(0.66)
Number of Business Units		−2.32***			
		(0.58)			
Number of Location Units			1.84***		
			(0.55)		
Firm Age				0.19	
				(0.52)	
Tobin's Q Ratio					4.58***
					(0.41)
Ln Market Capitalization	6.27***	2.92***	2.70***	2.94***	2.66***
	(0.40)	(0.18)	(0.18)	(0.17)	(0.16)
Debt Ratio(%)	−0.12***	−0.11***	−0.12***	−0.10***	−0.09***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943
Adjusted R^2	0.30	0.33	0.34	0.34	0.35
Panel B: Governance Strength					
Intercept	−20.45***	−20.39***	−35.02***	−19.57***	−25.13***
	(2.24)	(2.07)	(3.45)	(2.01)	(1.75)
CEO Duality	−5.14***	−6.40***	-3.20	−4.55***	−5.15***

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Table 51 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
	(1.34)	(1.28)	(2.40)	(1.10)	(0.89)
CEO off Board	−4.78***	−3.20***	-1.76	−2.33***	−5.57***
	(0.63)	(0.67)	(1.18)	(0.59)	(0.65)
Board Size*CEO Duality	-0.95				
	(2.10)				
Board Size*CEO off Board	2.91***				
	(0.73)				
Percentage of Independent Directors*CEO Duality		3.24			
		(1.97)			
Percentage of Independent Directors*CEO off Board		0.17			
		(0.81)			
Board Ownership*CEO Duality			−6.19**		
			(2.71)		
Board Ownership*CEO off Board			−7.77***		
			(1.57)		
Multiple Directorships (Independent Companies)*CEO Duality				0.49	
				(2.04)	
Multiple Directorships (Independent Companies)*CEO off Board				−1.90***	
				(0.01)	
Block Shareholding*CEO Duality					-2.96
					(2.12)
Block Shareholding*CEO off Board					4.28***
					(0.85)
Board Size	−1.73*				
	(0.46)				
Percentage of Independent Directors		-0.73			
		(0.54)			

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Table 51 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
Board Ownership			4.06***		
			(0.96)		
Multiple Directorships (Independent Companies)				0.33	
				(0.49)	
Block Shareholding					0.31
					(0.50)
Ln Market Capitalization	2.82***	2.83***	4.21***	2.69***	3.20***
	(0.19)	(0.18)	(0.28)	(0.18)	(0.16)
Debt Ratio(%)	−0.10***	−0.11***	−0.15***	−0.10***	−0.11***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943
Adjusted R^2	0.34	0.33	0.33	0.33	0.34

Table 51 reports the regression results of ROAs on the different extent of CEO board involvement and its interaction terms with information opacity and governance strength variables. Panel A presents the results when firms' information opacity variables are interacted with CEO duality and CEOs off the board. The results from column (1) reveal some interesting relationships. First, the coefficient on the intercept indicates that the component of ROA that is unrelated to the effect of firms' market capitalization for firms with CEO-director is positive and significant. In addition, the coefficient on the natural log of market capitalization suggests that for this group of firms, an increase in market capitalization is associated with higher ROAs. Second, for firms with CEO duality, small firms are associated with lower ROAs compared to firms with CEOs on the board only. The coefficient on the interaction term between CEO duality and market capitalization means that this relationship is unaffected by the change in firm size. Third, for small firms, CEOs off the board underperform CEO-directors. However, this relationship is mitigated in large firms. In other words, in a more opaque information environment, the benefits of CEOs off the board (or the costs of CEOs on the board) increase with firm size, which is consistent with CEO utility maximization.

In fact, the results from Panel A provide mixed evidence for shareholder value maximization and CEO utility maximization. For instance, the coefficient on "Number of Business Units* CEO off Board" from column (2) and the coefficient on "Tobin's Q Ratio*CEO Duality" from column (5) find that the benefits of a lower degree of CEO board involvement outweigh the associated costs in a more opaque information environment, providing evidence for managerial utility maximization. On the other hand, the coefficient on "Firm Age*CEO off Board" from column (4) and the coefficient on "Tobin's Q Ratio*CEO off Board" suggest that the costs of a lower degree of CEO board involvement are greater than the associated benefits or the benefits of a higher degree of CEO board involvement are greater than the associated costs in a more opaque information environment, providing evidence for shareholder value maximization.

The results from Panel B provide mixed evidence for the effect of a stronger governance environment on the relationship between the extent of CEO board involvement and ROAs. For example, the coefficient on "Board Size*CEO off Board" from column (1), the coefficient on "Board ownership*CEO off Board" (column (3)), and the coefficient on

"Multiple Directorships*CEO off Board" suggest that the negative effect of CEOs off the board is mitigated in a stronger governance environment.

On the other hand, the coefficient on "Board ownership and CEO Duality" (column (3)) suggests that the costs of CEO duality increase in a stronger governance environment whereas the coefficient on "Block Ownership*CEO off Board" (column (5)) suggests that the benefits of CEOs off the board increase in a stronger governance environment.

Table 52 Regression Results of ROE on CEO Board Involvement with Interaction Terms

This table reports the estimation results for equation (6.18). The dependent variable is ROE. Natural log of market capitalization, number of business units, number of location units, firm age, Tobin's Q ratio, board size, percentage of independent directors, board ownership, multiple directorships and block shareholding are indicator variables that take a value of 1 if these variables are greater than the respective median values in the sample, 0 otherwise. All the regressions include year dummy variables and industry dummy variables. Terms in parentheses are standard errors estimated based on the OLS regressions while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Panel A: Information Opacity					
Intercept	12.99**	−51.58***	−46.01***	−49.06***	−55.25***
	(1.51)	(4.79)	(4.25)	(4.50)	(5.11)
CEO Duality	−15.10***	−12.80***	−10.73***	-13.84	-0.47
	(5.59)	(4.77)	(2.96)	(8.98)	(3.26)
CEO Off Board	−6.69***	−11.75***	−10.31***	−9.81***	-0.57
	(2.37)	(1.77)	(1.86)	(1.84)	(1.60)
LnMarket Capitalization*CEO Duality	10.16				
	(6.61)				
LnMarket Capitalization*CEO off Board	-1.08				
	(2.63)				
Number of Business Units*CEO Duality		-2.82			
		(5.52)			
Number of Business Units*CEO off Board		7.50***			
		(2.50)			
Number of Location Units*CEO Duality			-6.69		
			(7.25)		
Number of Location Units*CEO off Board			3.09		
			(2.69)		
Firm Age*CEO Board Duality				-5.55	

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Table 52 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
				(9.86)	
Firm Age*CEO off Board				1.23	
				(2.16)	
Tobin's Q Ratio*CEO Duality					−19.35***
					(5.34)
Tobin's Q Ratio*CEO off Board					−12.55***
					(1.63)
Number of Business Units		−3.59***			
		(1.32)			
Number of Location Units			2.00		
			(1.25)		
Firm Age				0.72	
				(1.34)	
Tobin's Q Ratio					11.92***
					(1.06)
Ln Market Capitalization	8.37***	6.35***	6.01***	6.26***	6.20***
	(1.16)	(0.43)	(0.43)	(0.40)	(0.40)
Debt Ratio(%)	−0.21***	−0.16***	−0.19***	−0.18***	−0.20***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943
Adjusted R^2	0.21	0.24	0.25	0.24	0.26
Panel B: Governance Strength					
Intercept	−39.66***	−43.67***	−57.72***	−39.42***	−61.92***
	(4.02)	(3.70)	(4.83)	(3.70)	(4.23)
CEO Duality	−12.29***	−9.26*	−9.30**	−16.52***	−15.29***

Continued on next page

Table 52 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
	(4.15)	(5.08)	(4.22)	(4.99)	(2.55)
CEO Off Board	12.80***	−10.92***	−6.61***	−7.78***	−22.96***
	(1.79)	(1.69)	(1.61)	(1.69)	(1.93)
Board Size*CEO Duality	6.14				
	(4.90)				
Board Size*CEO off Board	6.91***				
	(1.96)				
Percentage of Independent Directors*CEO Duality		-2.78			
		(6.66)			
Percentage of Independent Directors*CEO off Board		3.08			
		(2.27)			
Board Ownership*CEO Duality			-3.71		
			(3.96)		
Board Ownership*CEO off Board			−3.99**		
			(1.84)		
Multiple Directorships (Independent Companies)*CEO Duality				5.68	
				(5.74)	
Multiple Directorships (Independent Companies)*CEO off Board				-1.50	
				(1.90)	
Block Shareholding*CEO Duality					-6.50
					(8.32)
Block Shareholding*CEO off Board					19.76***
					(2.57)
Board Size	−2.89***				
	(1.04)				
Percentage of Independent Directors		−4.66***			
		(1.14)			

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Table 52 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
Board Ownership			5.65***		
			(1.14)		
Multiple Directorships (Independent Companies)				-1.28	
				(1.06)	
Block Shareholding					-0.10
					(1.16)
Ln Market Capitalization	5.54***	6.00***	6.59***	5.69***	7.29***
	(0.41)	(0.40)	(0.42)	(0.41)	(0.39)
Debt Ratio(%)	−0.20***	−0.20***	−0.19***	−0.22***	−0.19***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	943	943	943	943	943
Adjusted R^2	0.25	0.24	0.25	0.25	0.26

Panel A of Table 52 presents the estimation results when firms' information opacity variables are interacted with CEO duality and CEOs off the board. The coefficient on "Number of Business Units*CEO off Board" suggests that the benefits of CEOs off the board increase in firms with more business units; the coefficient on "Tobin's Q Ratio*CEO Duality" indicates the costs of CEO duality increase in firms with more growth opportunities. Both coefficients suggest that the benefits of a higher degree of CEO board involvement decreases in a more opaque information environment, providing evidence for the presence of managerial entrenchment. To the contrary, the coefficient on "Tobin's Q Ratio*CEO off Board" provides support for shareholder value maximization.

Panel B of Table 52 shows that the evidence from board size and board ownership is consistent with the argument that the costs of a lower degree of CEO board involvement (or the benefits of a higher degree of CEO board involvement) increase in a stronger governance environment whereas the positive coefficient on "Block Shareholding*CEO off Board" suggests that the benefits of a lower degree of CEO board involvement increase in a stronger governance environment.

Table 53 Regression Results of Alpha on CEO Board Involvement with Interaction Terms

This table reports the estimation results for equation (6.18). The dependent variable is Jensen's alpha. Natural log of market capitalization, number of business units, number of location units, firm age, Tobin's Q ratio, board size, percentage of independent directors, board ownership, multiple directorships and block shareholding are indicator variables that take a value of 1 if these variables are greater than the respective median values in the sample, 0 otherwise. All the explanatory variables are in lagged values. All the regressions include year dummy variables and industry dummy variables. Terms in parentheses are standard errors estimated based on the OLS regressions while allowing for robust standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Panel A: Information Opacity					
Intercept	-1.19	2.48	-1.18	-1.23	-2.30
	(2.20)	(3.00)	(2.27)	(2.67)	(2.13)
CEO Duality	10.43***	7.38*	8.24**	13.64	19.58***
	(3.98)	(4.16)	(4.15)	(8.66)	(6.06)
CEO Off Board	-1.68	−3.72**	−4.22*	−5.17**	4.35***
	(2.76)	(1.55)	(2.46)	(2.41)	(1.63)
LnMarket Capitalization*CEO Duality	−14.63*				
	(8.04)				
LnMarket Capitalization*CEO off Board	-2.51				
	(3.20)				
Number of Business Units*CEO Duality		-6.66			
		(7.34)			
Number of Business Units*CEO off Board		7.43*			
		(3.79)			
Number of Location Units*CEO Duality			-6.52		
			(7.84)		
Number of Location Units*CEO off Board			3.29		
			(3.14)		
Firm Age*CEO Board Duality				-12.05	

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Table 53 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
				(9.54)	
Firm Age*CEO off Board				5.88**	
				(2.84)	
Tobin's Q Ratio*CEO Duality					−21.51***
					(8.01)
Tobin's Q Ratio*CEO off Board					−13.85***
					(3.30)
Number of Business Units		−7.87***			
		(2.19)			
Number of Location Units			1.54		
			(1.80)		
Firm Age				0.17	
				(1.77)	
Tobin's Q Ratio					5.97***
					(1.99)
Ln Market Capitalization	0.55	0.72	-1.37	-0.79	-0.57
	(1.83)	(1.43)	(1.85)	(1.61)	(1.71)
Market-to-Book Ratio	−2.11***	−2.49***	−1.95***	−2.05***	−2.20***
	(0.44)	(0.48)	(0.45)	(0.44)	(0.52)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	731	731	731	731	731
Adjusted R^2	0.10	0.11	0.09	0.10	0.10
Panel B: Governance Strength					
Intercept	0.51	0.15	1.99	6.58	5.28
	(2.37)	(2.19)	(2.38)	(5.71)	(6.69)
CEO Duality	6.31	9.15*	-2.01	-0.67	1.36

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Table 53 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
	(4.20)	(5.25)	(4.19)	(5.51)	(4.67)
CEO Off Board	−5.97***	-0.13	-0.12	-2.37	-2.30
	(2.13)	(2.91)	(1.47)	(1.55)	(3.39)
Board Size*CEO Duality	-16.26				
	(15.24)				
Board Size*CEO off Board	9.39***				
	(2.91)				
Percentage of Independent Directors*CEO Duality		-9.01			
		(7.07)			
Percentage of Independent Directors*CEO off Board		-1.47			
		(1.74)			
Board Ownership*CEO Duality			14.69***		
			(4.32)		
Board Ownership*CEO off Board			-5.10		
			(4.06)		
Multiple Directorships (Independent Companies)*CEO Duality				8.75	
				(6.80)	
Multiple Directorships (Independent Companies)*CEO off Board				-2.45	
				(1.98)	
Block Shareholding*CEO Duality					8.20
					(6.84)
Block Shareholding*CEO off Board					1.56
					(3.69)
Board Size	−3.02*				
	(1.73)				
Percentage of Independent Directors		-1.48			
		(2.91)			

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Table 53 – continued from previous page

	(1)	(2)	(3)	(4)	(5)
Board Ownership			-2.83^{***}		
			(1.67)		
Multiple Directorships (Independent Companies)				1.42	
				(1.77)	
Block Shareholding					-3.21
					(2.16)
Ln Market Capitalization	0.21	-0.69	-0.91	-0.67	-0.27
	(1.64)	(1.30)	(1.41)	(0.46)	(0.49)
Market-to-Book Ratio	-1.91^{***}	-2.03^{***}	-1.93^{***}	-1.94^{***}	-1.93^{***}
	(0.46)	(0.45)	(0.44)	(0.46)	(0.46)
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	731	731	731	731	731
Adjusted R^2	0.10	0.09	0.10	0.10	0.10

In Panel A of Table 53, the coefficients on the interaction between CEO duality and firm size in column (1), the interaction between CEOs off the board and the number of business units in column (2), the interaction between firm age and CEOs off the board in column (4), and the interaction between Tobin's Q ratio and CEO duality in column (5) indicate that the benefits of a higher degree of CEO involvement decrease in a more opaque information environment, which is consistent with managerial utility maximization. However, the coefficient for the interaction between Tobin's Q ratio and CEOs off the board suggests the opposite, hence providing evidence for shareholder value maximization.

When the extent of CEO board involvement is interacted with firms' governance strength variables, the models for board size and board ownership produce statistically significant coefficients on the interaction terms. Specifically, their results indicate the benefits of a higher degree of CEO board involvement increase in a stronger governance environment or a higher degree of CEO board involvement is more beneficial in a stronger governance environment.

Overall, the analysis in this section provides evidence that the effects of the different degrees of CEO board involvement on firm performance differ in the change of the opacity of firms' information environment and the strength of governance environment. The difference in the effects reflects both the shareholder value maximization argument and the managerial utility maximization argument. This may imply that shareholders and CEOs have different abilities to exert their influence over firms to maximize their utilities.

Chapter 7

Case Studies of Switching Firms

This chapter provides a discussion of the firms that changed their CEO board membership status over the sample period, either from CEO on the board to CEO off the board or from CEO off the board to CEO on the board, or experienced multiple changes. Due to the limited number of firms that changed their CEO board membership choice, it may not be sufficient to conduct statistical analysis. However, the sample of firms provides an attractive case study setting that allows me to further probe the underlying reasons for each CEO board membership choice.

7.1 Overview

The choice of whether the CEO is on the board or off the board may change over the sample period. These companies are defined as "switching" firms. Some of the switches may be only temporary[1] (possibly due to a change in the CEO) while other changes seem to be more permanent. Two situations are treated as permanent changes: first, a company made a change in the CEO board membership choice over the sample period and never changed it back; second, the switch remained for more than one year and the operation of the company was conducted under an adoption of a new strategy. Table 54 presents the firms that made permanent changes over the sample period.

Table 54 shows that of the 152 unique firms in my sample, 12 changed their CEO

[1]For example, the CEO in Affco Holdings was off the board between 1997 and 2008 except in 2001. In this case, Affco Holdings is recognized as a CEO-off-the-board firm.

board membership status during the sample period. It is noticeable that a majority of the switching firms changed from CEO on the board to CEO off the board whereas there were only three incidences of switching to CEO on the board. In fact, these three firms - Charlie's Group Limited, Lyttelton Port Company Limited, and The Warehouse Group Limited - changed their CEO board membership status twice over the sample period.

Table 54 Summary Table for Switching Firms

This table lists the summary of the firms that switched to CEO on the board and firms that switched away from CEO on the board.

Company Name	Switching Year	Switching To	Switching Away
Air New Zealand Limited	2006		√
Auckland International Airport Limited	2004		√
Charlie's Group Limited	2001		√
Charlie's Group Limited	2006	√	
Contact Energy Limited	2006		√
Cue Energy Resources Limited	1999		√
Genesis Research and Development Corporation Limited	2005		√
Lyttelton Port Company Limited	1999	√	
Lyttelton Port Company Limited	2003		√
Metlifecare Limited	1999		√
Owens Group Limited	2000		√
Ryman Healthcare Limited	2007		√
The Warehouse Group Limited	2001		√
The Warehouse Group Limited	2004	√	
Wake Field Hospital Limited	2006		√

This rest of this chapter attempts to explore the underlying reasons of the change in the CEO board membership decision for each individual firm. I make inferences of the switches based on information from companies' annual reports, market announcements surrounding the changes, and news from the media.

7.2 Air New Zealand Limited

Air New Zealand Limited was established in 1940 as Tasman Empire Airways Limited, operating flights between New Zealand and Australia. It became wholly owned by the NZ government in 1965, whereupon it was renamed Air New Zealand. It was privatized in 1989,

but renationalized in 2001 under a NZ government NZ$885 million rescue plan, following a NZ$1.425 billion operating loss in 2001 due to the acquisition of Ansett Australian in 2000, an action many believed to be a critical mistake.

Sir Ralph Norris was appointed as the CEO and a board member of Air New Zealand on the verge of collapse in 2001 (Before taking the CEO position, Mr Norris had been a board member since 1998.). Under his leadership, Air New Zealand returned to profitability in 2003 with a net profit of NZ$165.7 million. In June 2005, he made an announcement about his resignation as the managing director and CEO of Air New Zealand, and accepted the position of managing director and CEO of the Commonwealth Bank of Australia. Mr Norris departed the company on August 31, 2005. Although the company had generated positive net profit while he left, the company' shares had been generating negative returns for a few years, which, as the chairman addressed, reflected market concerns largely over the fuel price and competitive environment.

In October of the same year, Mr Robert Fyfe succeeded Ralph Norris as the CEO. Before taking this role, Mr Fyfe was the Chief Information Officer during 2003 and then took the role of Group General Manager in Airlines division. While Mr Norris was an official member of Air New Zealand board, Mr Fyfe had never been on the board until his resignation in 2012. When he started as the CEO, he took immediate actions on reforms. Just five days into the role, he announced plans to cut more than 600 engineering jobs and the closure of the wide-body aircraft maintenance base at Auckland Airport. In addition, another 450 head office support staff were laid-off and more than 110 aircraft cleaners were transferred to a contracting company, or made redundant.[2] After his transition as the CEO, the company maintained a relatively sound accounting performance while the stock market performance improved, in particular its share price had doubled for the 2007 financial year.

On his departure, he was clear to the board that "he did not want to become a road block to the career aspiration of the executive management team and the decision to leave at the end of this will create an opportunity for growth and renewal within that team at Air New Zealand" (from Air New Zealand market announcement on 31 January, 2012). He also said that "I'm very conscious that I am surrounded by many very talented and

[2]See http://www.stuff.co.nz/business/industries/6364713/Fyfe-can-write-his-own-ticket

capable executives and if they are to grow and realize their full potential I have to create the space to allow them to do so". Mr Fyfe took up a position to the board of Antarctica New Zealand in early 2013.

Surrounding the switch of CEO board membership decision, Air New Zealand's governance environment had insignificant changes. One obvious change was that the board size had decreased by one board member, resulting in the board of Air New Zealand being comprised solely of independent directors. In addition, the 2005 annual report presented a statement on "Board Independence from Management" whereas this statement disappeared in the 2006 annual report.[3] The block shareholding and board ownership remained relatively stable between 2005 and 2006. Specifically, the block shareholdings were 80.38% and 80.14%, respectively and board ownership remained at approximately 0.01%. One interesting phenomenon was that Mr Norris held 198,805 beneficial shareholding in 2005, Mr Fyfe held 716,431 shares in the company, which ranked him as the 20th largest shareholder in the company in 2006.

Air New Zealand and other sources had never explained the reason for Mr Fyfe's absence from the board. It seemed to be a puzzle given his large shareholding in the company (hence an interest-alignment mechanism in place). One arguable reason for Mr Fyfe's absence from the board was that unlike Mr Norris, who had been on the board even before taking the CEO position, Mr Fyfe was not a board member before his appointment. The board might not see any additional advantage of having him on the board because Mr Fyfe and the board might be already familiar with each other and had mutual understanding through his appointment as the Chief Information Officer and Group General Manager Airlines in the company. Therefore, the benefit of CEO board membership decreases.

7.3 Auckland International Airport Limited

Auckland International Airport Limited commenced operations in 1955. It is the largest and busiest airport in NZ. The airport is one of NZ's most important symbolic infrastruc-

[3]The 2005 Board Independence from Management statement specified that "The Board meets at least once a year without management present for additional opportunity for open discussion on Air New Zealand issues".

ture assets, providing thousands of jobs for the region. The airport is the fourth busiest in Australasia after Sydney, Melbourne, and Brisbane airports. It has been rated in the top 3 worldwide for airports with 5-15 million passengers each year. It has also been voted the 8th best airport in the world at the world airport awards in 2011.[4]

Mr John Goulter served as the managing director of the company since 1988. At that time, the company's total revenue was $68 million. In 2002, the after tax profit was $71.5 million. During his term as the managing director, he took revenue to after-tax profit. In July 2002, Auckland International Airport announced that Mr Goulter would be retiring in September 2003. The market announcement stated that the reason for his departure was "Mr Goulter felt that, in turning 62 years of age in late 2003 and after 15 years in the top role, it was the appropriate time to transfer the leadership role to new management" (from market announcement on 15 July, 2002). There seemed not to be any suspicion about his departure in terms of firm performance (ie., the stock return was 16.7% in 2003).

In April 2003, Auckland International Airport Ltd chairman announced Mr Don Huse as the new CEO to succeed Mr Goulter. Mr Huse was the CFO for Sydney Airprot Corporation since 1998. Prior to that, he was the CEO of Wellington International Airport Limited. On his appointment as the new CEO of the company, the board stated that the appointment of Mr Huse as a director would be considered by the board in due course. However, Mr Huse was never appointed to the board until his retirement from the company in 2008.

There were no statements or comments made about Mr Huse's absence from the board. While the company's governance environment, in terms of block shareholding and board ownership, changed in a minor way, a relatively more significant change might be the emphasis on the monitoring role of the board.[5] Specifically, Auckland International Airport Ltd had a much comprehensive "Corporate Governance" section in their 2004 annual report compared to that in the 2003 report. One obvious difference was that the "Corporate Governance" section was only one page in the 2003 annual report whereas it was 6 pages in the 2004 report with 10 major principles and many more sub-points.

[4]See http://www.worldairportawards.com/Awards_2011/Airport2011.htm

[5]The block shareholding and board ownership were 47.96% and 0.04% (excluding managing director shareholding), respectively in 2003 and 43.65% and 0.04%, respectively in 2004.

In addition, aside from the delegation of authorities to the CEO, nothing was mentioned about the monitoring of the CEO or the management team in the 2003 annual report. On the contrary, the 2004 report made explicit statements about the monitoring of the CEO and the management team. Specifically, Principle 1 states that the primary roles of the board include: "ensuring with management that the strategic goals of the company are clearly established, and that strategies are in place for achieving them";"monitoring the performance of management in implementing the strategies";"appointing and reviewing the performance of the chief executive officer and, where necessary, terminating the chief executive officer's employment with the company"; "approving the appointment of the corporate secretary and the remuneration policies applicable to senior management"; "approving and monitoring the company's financial statements and other reporting, including reporting to shareholders, and ensuring the company's obligations of continuous disclosure are met"; "ensuring that the company adheres to high standards of ethics and corporate behavior".

It can be seen at least from the annual report that Auckland International Airport Ltd placed more emphasis on the monitoring role of the board after the switch. This might be due to the compliance of the spirit of the Corporate Governance Best Practice Code or the NZX Code, introduced in 2003, which aimed to promote a better corporate governance. At the same time of Mr Huse' appointment, the board stated that the directors would look to appoint a further non-executive director in late 2003 to bring the number of directors back to six. It seems that the company had a preference for a non-executive director and a board size of six. In fact, after the appointment of the new director in late 2003, all the directors are independent directors.

7.4 Charlies' Group Limited

Charlies' Group Limited was first established in 1982, originally known as Crusader Minerals N.Z. Limited, and delisted in 2011. The development of the operations of Charlies' Group Limited experienced three phases and the choice of CEO board membership switched along these three phases. First, the company was floated in 1983 to be involved in gold mining ventures. In 1985, the company was renamed as Spectrum Resources Limited. In

1993, the company negotiated a restructuring plan with International Resource Development, this company's controlling shareholder Mr Terry Bates, and Spectrum's majority shareholders, involving the reactivation of Spectrum's mining interests through the acquisition of exploration rights in Chile and the sale of Spectrum's tin mine in Australia. The restructuring plan included but was not exclusive to purchasing all the shares in Notre Dame Investment Ltd (from International Resource Development Ltd), a company that indirectly held mining exploration interests in Chile. This purchase was satisfied by the issue of shares to Mr Bates. Following this restructuring, Mr Bates, together with International Resource Limited, became a substantial shareholder and Mr Bates was appointed as the managing director of Spectrum Resources. In 1994, Spectrum Resources purchased 50% of Asian Mineral Resources Ltd, a private company whose only asset was a 70% interest in a joint venture with an agency of the Vietnamese government - Ministry of Heavy Industry. After this acquisition, the company had a focus on operations in Vietnam. In 1995, Mr Bate advanced additional NZ $150,000 to enable the company to take advantage of opportunities for advance development exploration work.

The second phase began in 1999 when the company made a decision to change its direction of business to business e-commerce solutions. In February 2000, after capital raising from Momentum Investments and additional share issuance, Spectrum Resources acquired WEL Technology (subsequently known as Kinetiq) from WEL Energy Group for NZ $2 million. Due to the change of direction of Spectrum, Mr Bate was resigned from the board as the managing director and at the same time, Mr Peter Masfen, the Chairman of the company since 1983 resigned from the board after overseeing the reconstruction of the company and the disposal of the mining assets. In March 2000, Mr Rob Levison, who was a director of D F Mainland Forest & Financial Ltd, was announced as the new managing director of Spectrum Resources. One of D F Mainland Forest & Financial Ltd' subsidiaries had 5% shareholding in Spectrum Resources. After 18 month of leadership, Mr Levison stepped down as the managing director. The board said "Mr Levison has successfully guided the integration of Kinetiq, Spectrum's wholly-owned subsidiary, with Spectrum Resources and is leaving the company to pursue a similar role overseas" (from market announcement on 17 May 2001). At the same time, the board said a replacement for Mr Levison was not being sought. Approximately one month later, Mr Gavin Mitchell,

the CEO of Kinetiq, was announced to take the role of CEO for Spectrum Group but not on the board. In 2002 and 2003, the company undertook two major actions, which involved forming a partnership to integrate its technologies and acquisition of another company providing real time energy management services.

The third phase started in 2005 when Spectrum Resources purchased all of the shares in Charlie's Trading Company Limited and changed its focus to beverage manufacturing industry. In July 2005, it changed its name to Charlie's Group Limited. The existing management of Charlie's continued their role in the new company. Hence, the managing director of Charlie's Trading Company Limited Mr Stefan Lepionka, also a founding member of the company, took the role of the managing director in the new company.

During the three different phases of development, the CEO was absent from the board between 2001 and 2005, ie., only Mr Mitchell was not on the board. Whereas there is no official reason for this absence, it might be better explained with the agency theory.

As envisaged by the theory, CEOs have personal incentives to behave towards their own interests at the expense of shareholders. However, if the interests between CEOs and shareholders are aligned, such conflicts of interests should disappear. This should be the case for Mr Bates and Mr Lepionka. After International Resource Development and its controlling shareholder Mr Bates involved in the restructuring plan in 1994, Mr Bates had a beneficial shareholding of 46.52%, held both individually and through his shareholding in International Resource Development. This made him the controlling shareholder in Spectrum Resources. Similarly, after the acquisition, Mr Lepionka held 16.44% of the company shares while the other two founding members of Charlies' Trading Company Limited combined also held the same shareholding. These three founding shareholders formed a controlling shareholding in Charlie's Group Limited. Both of the cases are consistent with the interest-alignment strategy to have the CEO on the board. In addition, since the CEO was the controlling shareholder (or at least a substantial shareholder in Mr Lepionka's case but as a founder of the company, he might have an emotional tie to the company that made his interests more aligned to other shareholders) in both cases, the directors may not be able to prevent the CEO on the board when the CEO wanted it.

Between 2001 and 2005, Spectrum Resources had two CEOs: Mr Levison was on the board whereas Mr Mitchell was not. While Mr Levison's shareholding in D F Mainland

Forest & Financial Ltd (and its subsidiary) could not be found, he did not have company shares in Spectrum Resources (while the employee remuneration was recorded Nil in the 2000 annual report, Mr Levison received $37,500 as director remuneration and benefits and 6,162,014 rights to 7 for 3 cash issue). Nevertheless, "his experience in company restructuring re-engineering and equity capital raising, particularly in the technology area" (from the 2000 annual report) might be particularly valuable for the company when the company was trying to integrate with Kinetiq. During that critical transitional point, it might be more beneficial for the company to have him on the board. Once the transition was complete, Mr Levison resigned and the CEO of Kinetiq was promoted to the CEO position in Spectrum Resources. It is hard to know Mr Mitchell's shareholding since the annual reports only disclose shareholding for directors and the 20 largest shareholders. Mr Mitchell was off the board possibly due to the lack of an interest-alignment mechanism.

7.5 Contact Energy Limited

Contact Energy Limited was incorporated in 1995 and in early 1996, it acquired electricity generation and gas assets from state-owned electricity generator ECNZ. Due to the subsequent expansion, the company became strongly positioned in the wholesale gas distribution, gas, and electricity retailing in NZ. In early 1999, the Crown sold 241.6 million shares in the company (for NZ$1.2 billion) to the cornerstone shareholder, Edison Mission Energy (EME) of the US following the sale of 362.4 million shares to the public. In 2004, EME sold its 51.2% holding in Contact Energy Limited to Australia's Origin Energy, and Origin became the company's majority shareholder.

Mr Stephen Barrett, the CEO, was seconded to the role by his employer EME in the company between 2000 and 2004. At the same time, he was also a board member of the company. After Origin finalized its purchase of Contact Energy's shares, Mr Barrett only assumed the CEO role and stepped aside from the board. The reason for this was explicitly stated in the market announcement on 13 September, 2004 that Origin wished to reduce the current board size of eight to six, who together brought an excellent mix of experience and skills when it became the majority shareholder. To facilitate such a change, Mr Barrett and other directors affiliated with EME were removed from the board. However, Origin

appreciated Mr Barrett's leadership and business skills, and would like to retain him as the CEO. Mr Barrett accepted this offer and stepped aside form the board and became an employee of Contact through to 30 September 2005. In return, Mr Barret received a total remuneration of approximately NZ$1.05 million, which was almost unchanged compared to that received when employed under EME. The successor of Mr Barret, Mr David Hunt assumed the CEO position from 1 October 2005. Consistent with Origin's preference, Mr Hunt was also off the board.

7.6 Cue Energy Resources Limited

Cue Energy Resources Limited (formerly known as Cue Energy Resources NL) is an oil and gas exploration, development, and production company. It was incorporated and listed in 1981 in NZ but had a registered business headquarter in Melbourne and listed on the ASX in 1985. From 1992 to 1995, the company had been focused on growth by first raising sufficient capital and then by acquisition of existing production to obtain a critical size. After a failure of a major acquisition in 1995, the company shifted its focus to smaller but more attainable goals to consummate acquisitions. In 1996, Cue Energy Resources completed the first significant acquisition - CMS Nomeco PNG Oil Co., as well as other plans in Australia. In early 1997, Cue Energy made its first investment in Indonesia - Tanjung Jabung Production Sharing Contract (PSC). In 1996 -1997 annual report, the Chairman of the company, Mr Ernest Albers announced that the company had acquired a sufficient number of projects to form the nucleus of a medium sized oil and gas exploration company. This enabled the company to move from an "acquisitions" growth strategy to "organic" growth, which meant the existing projects were ready to mature and put into production. In 2003, it further acquired Sampang PSC in East Java, Indonesia which contains the Oyong oil and gas discoveries. In May 2005, the company de-listed from the NZX, and re-listed in late 2009 after issuing shares. At present, the company operates six exploration permits in Australia and other projects in Papua New Guinea, Indonesia, and New Zealand.

Mr Frank Jacobs was the managing director of Cue Energy Resources Limited since early 1994. With activity focus in Indonesia, Mr Jacobs and one of other senior manage-

ment members were transferred to Jakarta to oversee the implementation and operations of the new projects in 1996. In late 1997, the company entered into a litigation with Norwegian company, Saga Petroleum Jambi ASA, which was once believed to be the "most important acquisition to date" when the Sale and Purchase Agreement was signed in May 1997. This agreement involved the purchase of Saga's 50% interest in the Jambi Merang PSC, subject to formal approvals, both from the Indonesian government and other consents of a commercial nature. Once effective, the contracted area was adjacent to and directly south of the Tanjung Jabung PSC and contained part of the Gelam Gas Field and the Palau Gading Gas discovery, both of which were for appraisal and development in 1998. The Palau Gading Gas discovery was believed to have the capacity to contain a large field and be in a good position to benefit from domestic markets for gas within Indonesia. The official documents were not obtained by the initially expected completion date and after various extensions of time, Cue Energy Resources Limited decided to terminate the agreement. Saga disputed the company's right to this termination and commenced a legal action in the High Court of Justice of England. The stock market responded negatively to these events and the share price went down by approximately 45% over a two-month period. Mr Jacobs resigned on February 19th, 1998 but was effective on February 18th, 1998. This might be an indication of a forced resignation, possibly due to the breakdown of the agreement with Saga and the litigation arising from it.

In September 1999, the company negotiated a settlement for the litigation, which involved cash settlement, in addition to issuing additional shares and options to Saga. The settlement was executed in November 1999. Apart from US$2 million cash settlement, the company increased ordinary shares by 3% and non-transferable share options by 12 million. After two requests for a special shareholder meeting from a substantial shareholder requesting removal of current board members on September 16th, 1999 and January 14th, 2000, respectively, Mr Eernest Albers, the founder and chairman of Cue Energy Resources Limited since its establishment in 1981, resigned on March 6th, 2000 (but he rejoined the board as a non-executive director in Auguest 2001). Other directors also resigned from the board. In addition, the largest shareholder of the company since 1995 sold all its shares and after this transaction, new directors by the new shareholder were appointed. For the 1999-2000 financial year, the company's ROA was -26.52%, down by 35% from the previous

year, and ROE was -43.77%, down by 53.3% from the previous year.

After the board restructuring, the new board announced some initiatives for capital reconstruction and a change in its strategy by intending to invest in technology related projects. After Mr Jacobs' resignation, Mr Robert Coppin was appointed as the acting CEO, who was soon elevated as the CEO of the company. At the time of Mr Coppin's appointment, the board said "(i)t plans to leave the position of Managing Director vacant until the Saga litigation is resolved" (from the 1998 annual report). However, this never happened during his 13 years tenure in the company (although he was a director of the subsidiary company in Australia).

Although no further reason had been given about this arrangement, the company's governance environment experienced significant changes between 1999 and 2000. First, the board size had decreased from six board members in 1999 to three board members in 2000; second, board ownership had increased from 8% to 28.04% (the majority of the increase was due to shares held by associated persons of the newly appointed directors); third, the board members held 8 directorships in other companies in 1999 whereas the number had increased to 31 in 2000.

All the changes in these three measures indicate a stronger governance environment than before. Based on the theoretical framework developed in Chapter 3, the CEO off the board in this case coincides with CEO interests. However, for this particular case, it might also be the decision driven by the board. Specifically, there might have been undesirable experience when Mr Jacob was on the board, in particular regarding the Saga issue, and the new board might have been reluctant to have the new CEO on the board as a result.

7.7 Genesis Research and Development Corporation Limited

Genesis Research and Development Corporation Limited is a biotechnology company, incorporated in 1993 by Dr.Jim Watson and a group of scientists from the Auckland University Medical School. The company is based in Auckland, NZ, with genomic programs in human health, forestry, and agriculture. The company's focus is on research and development, and

partnerships with biopharmaceutical, agricultural, and forestry companies provide fundings for developing potential products. The company was listed on the NZX in 2000. In April 2003, due to the increasing demand for different business plans and different risk profile, the company announced the decision to separate its two business units (a health business unit and a plant business unit) by moving the plant division into a separate subsidiary, fully owned by Genesis. The separation of the companies allowed each business to be viewed, managed, and understood as a separate business proposition, which enabled investors and analysts to value each one independently. The plant science subsidiary was named AgriGenesis Biosciences Limited. The transfer of the plant sciences business was completed in December 2003 and the company announced that AgriGenesis was ready for trading in the market to raise capital and appointed Dr.Peter Lee as the CEO of AgriGenesis. However, the capital raising was not successful, and Dr Peter Lee left the CEO position at the end of 2004.

As the founder of the company, Dr.Jim Watson was a board member since its establishment and assumed the role the CEO since 1997.[6] Dr.Watson also assumed the CEO position of AgriGenesis after Dr. Lee's departure in 2004. However, not long after Dr. Watson's new involvement in AgriGenesis, Genesis announced the appointment of a new CEO - Mr Stephen Hall, who had been the Head of the Corporate Service since 2000. The company stated that Dr. Watson will commence the new role of Founder Scientist. A few days after his departure, the company announced that Phase II trail of its childhood eczema therapeutic candidate AVAC failed its target (this was the second failed trial over the past 12 months). After Dr. Watson left, the company's largest shareholder - Wrightson Limited - disposed of its shareholding in Genesis on the account that Genesis' R&D program no longer supported the strategic direction Wrightson wished to pursue in biotechnology. Indeed, the 2005 annual report revealed a change in the company's operating strategy. Specifically, the company made a transition from a large multi-project company to a smaller operation primarily focused on RNAi Therapeutics. However, it was unclear whether Wrighton's exit was the result of disappointment by the consecutive trail

[6]The Company Research website only provides this company's annual reports back to 1996, therefore the information on prior board membership is not available. However, given that Dr.Jim Watson was the founder of the company, it is likely that he was on the board since its incorporation.

failures or the change in operating strategy.

Along the transition, other aspects of the governance environment remained relatively stable except for board size and block shareholding. Specifically, the board size had decreased from seven members in 2004 to five members in 2005, and the block shareholding increased from 36% to 45%, both of which represented a stronger governance environment.

While Mr Hall was not appointed to the board and there was no reason given for this arrangement, it seemed that there was no particular reason for him to be on the board. A biotechnology company requires a board with both experienced scientists to evaluate biotechnology complexities and business people to understand how science can be commercialized. Although Mr Hall was heavily involved in the company's commercial activities since 2000, his expertise might not be particularly needed at the board level given that the board was comprised of four scientists and one bio-entreprenueur with significant commercial background at the time.

7.8 Lyttelton Port Company Limited

Lyttelton Port Company Limited was incorporated in 1988 and listed in 1996, specializing in cargo handling and port services. It is the main port in the South Island.

Mr David Viles joined the company in 1991 as an operation manager. After playing a significant role in port reform, which improved financial performance, he was appointed as the CEO in 1995. He was the CEO during the successful listing in 1996. In 1998, he was appointed as the managing director. The company's annual reports showed a net after-tax profit of NZ$10 million in the years to June 30, 1996. For the 2002 financial year, the company's net after-tax profit had reached more than NZ$16.3 million. However, the growth was combined with a number of controversies, such as over coal loading, the enclosure of the port area with higher-wire security fences, the eviction of private yacht owners from the inner harbor, the subsequent destruction of their vessels, and the Lyttelton marina.[7] The relation with the community hit the bottom when Mrs Christin Clarke, a port worker's wife, was manslaughtered during the strike of port workers and a strong group of local supporters against the company's decision to contract out its coal loading at

[7]http://www.accessmylibrary.com/coms2/summary_0286-27003724_ITM

the end of 1999. Due to these controversies, Christchurch City Holding Limited (CCHL), the Port's controlling shareholder, requested Mr Brent Layton to resign as the chairman in October, 2002. Two days later, Mr Layton tendered his resignation. Two weeks after Mr Layton's resignation, Mr Viles announced his resignation from the company, effective immediately.

Four days after Mr Viles' departure, Lyttelton Port entered into mediation with the combined unions to resolve the collective employment agreement. At the end of the mediation, the company and Combined Port Unions reached an agreement. After Mr Chris Connor had acted as the CEO for 6 month since Mr Viles' leaving, Mr Peter Davie was appointed as the CEO of the company. Mr Davie was a managing director of Australia's Port of Portland before coming to the company. At his appointment, Mr Barney Sundstrum, the new chairman, explicitly said "We were impressed by how Peter had successfully restructured labor relations at Portland. He brings a 'common touch', having personally led the negotiation with a very tough Australian union and still maintained huge respect from the workers. Portland Port has a reputation for efficient operations with a stable industrial record, and its ship turnaround times are amongst the best in Australia." It was clear that at the time, Lyttelton Port needed a CEO who could balance the interests of a variety of stakeholders.

Although the company's constitution provided for the appointment of a managing director by the board, Mr Davie was not appointed. Hence, the board size was reduced by one board member. The board had a policy to interact with management by site visits to view the company's operations and to familiarize with issues associated with the business. These visits usually involve interaction between directors and management and direct communication with employees when their particular area of expertise is required. Most contact was still with the CEO.

While there was no reason given for Mr Davie's absence from the board, it seemed that the company would ask the CEO on the board when the CEO had proved his or her capacity at both the operational level and strategic level (as for Mr Viles's case). To the contrast, under Mr Davie's leadership up to 2008, the company's net after-tax profit had been steadily decreasing (the company's net after-tax profit was NZ$12 million in 2004 and NZD$10 million in 2008, which was approximately the same level in 1996.).

7.9 Metlifecare Limited

Metlifecare Limited was incorporated in 1984 and originated from a joint venture between Clifford Cook and FAI Metlife. The original business focused on the development of retirement villages and related facilities and derived its income from service fees from units and facilities (occupancy fees) and sales of retirement units.

Mr Robert John Opiat joined the company in 1995 as the managing director. In May 1999, he resigned from this position but remained on the board as an executive director to oversee the transition. There was no reason given for this resignation. Mr Mark Russell was then appointed as the CEO but not on the board with no explanation. Mr Opiat resigned from the board two months after the transition. In September 1999, approximately one month after Mr Opiat's departure, Todd Capital Limited and United HealthCare started to acquire the company's shares. By the end of September, United HealthCare acquired a 10.11% shareholding in MetlifeCare and Todd Capital Limited acquired almost 35%. United HealthCare said "(t)he company seemed to have lost its direction and has been under performing for some time now. We believe that it is a direct result of lack of management focus and the uncertainty surrounding its future ownership" (from market announcement on 22 September, 1999). Indeed, by the end of August 1999, company's share price had reached a 20-month recored low. The decrease was particularly significant over the last 12 months, raising suspicion over Mr Opiat's departure. The share price also decreased by 15% after Mr Opiat's resignation as the managing director, which might reflect the uncertainty of the future direction of the company. Todd Capital Limited entered into a shareholding agreement with the company's founder and Deputy Chairman Clifford Cook to provide ownership stability for the next five years. In 2000, after being consulted for four months by Mr Gavin Aleksich, a corporate adviser from accountants Ferrier Hodgson, the company adopted a new business plan, which changed the focus of the group to operations, improved systems, continued development of the company's land bank, and strengthening the capital structure, rather than site development.

In July 2000, Mr Russel resigned from the company as the CEO unexplained. In December 2000, the company appointed Mr Gavin Aleksich as its new CEO, effective from 1 January, 2001. The chairman, Mr Fitzsimons, said "(f)ollowing that review, the company

now has a blueprint in place to enable it to go forward and grow over the next 4 years." Again, Mr Aleksich was not appointed to the board.

The company had its CEO off the board since Mr Opiat resignation. The implication of his resignation in terms of the governance environment was that the board size reduced by one board member. In addition, during the transition, the block shareholding increased by approximately 20%, contributed by United Healthcare Limited and New Zealand Funds Management Limited equally. Both of these changes strengthened the firm's governance environment. Under the theoretical framework, it is consistent with managerial utility maximization.

7.10 Owens Group Limited

Owens Group Limited was incorporated in 1973.[8] It was listed in 1985 after reconstruction of the Owens Group from private to public status. It then grew to become the largest integrated transport operator in NZ, with a presence in Australia.

Mr Rodger Fisher was the managing director of the company between 1987 and 1999. In December 1998, Mr Fisher advised his intention to retire to pursue a career as a professional director, taking effect from July 1999. In May 1999, Mr Ian Newman was announced to succeed Mr Fisher as the CEO of the company but not on the board. This transition was made in late July and early August. Within six months of Mr Newman's appointment, he undertook a comprehensive review of all business and made a few changes in terms of the operations of the company. Furthermore, apart from acquisitions made in Crossocean Forwarding Services (NZ) and Crossocean Forwarding Services Pty, it also disposed of certain property assets owned by its wholly owned subsidiary company in exchange for cash.

In terms of the governance of the firm, many aspects did not vary significantly except for the block shareholding. The company's block shareholding decreased from 65.66% in 1998 to 58.43% in 1999, representing a weaker governance environment. The fact that the CEO was off the board in a weak governance environment is consistent with shareholders'

[8]The company was also previously known as Mauao Holdings Limited until 1974, The Owens Group Limited until 1985 and Owens Investments Limited until 1988.

interests. In addition, Mr Fisher held shares in the company both beneficially and with other people when he was the CEO of the company whereas there is no evidence of Mr Newman's shareholding in the company. The weaker governance environment, combined with low (or zero) CEO shareholding, indicates a lack of governance mechanisms to monitor CEOs' behavior. Thus, it might be able to explain the new CEO's absence from the board.

7.11 Ryman Healthcare Limited

Ryman Healthcare Limited was incorporated in 1987.[9] The company specializes in providing Retirement Living options of New Zealanders over the age of 70. It provides a range of retirement living and care options, including independent townhouses and apartments, serviced apartments, and a care center providing resthome, hospital, and dementia level care. It was listed on the stock exchange in 1999.

Mr Kevin Hickman and Mr John Ryder co-founded the company and were the joint managing directors until 2002 when Mr Hickman held this role in his sole capacity and Mr Ryder assumed the position of Deputy Chairman. This move was announced explicitly for the purpose of a succession plan. The Chairman, Dr David Kerr, said that "the changes are part of the company's intentions to provide a succession plan for the future management of the company and to allow the younger management team to step forward. In recent years we have seen a very satisfying growth in the range of skills developed by senior management". Mr Ryder said that "since the public float and appointment of Simon Chalies as Chief Financial Officer, I am pleased to say that my day to day involvement has diminished and I am reassured that we have a very efficient corporate and administration structure in place." These statements hinted the company's intention to elevate Mr Simon Challies as the successor.

In August 2006, Mr Hickman stepped back from the managing director position and only stayed in the company as a director and a substantial shareholder. Not surprisingly, the CFO, Mr Simon Challies, was appointed as the CEO, but not on the board.

Surrounding the transition, some aspects of the firm's governance environment changed while others remained stable. Before the change, the board had a board size of six mem-

[9]It was previously known as Ryman Corporation Limited until 1997.

bers, with four independent directors and it remained the same after the change. However, the firm's block shareholding increased by more than 25% after the change and director shareholdings decreased by 32%, and the latter was mainly due to the share disposal by Mr Hickman.

Although out of the sample period, Mr Challies was appointed to the board as the managing director in 2010. Under Mr Challies' leadership, the company maintained a strong performance. Specifically, net after-tax profit had increased dramatically from NZ$35 million in 1996 to NZ$78.42 million in 2010, and share price had increased by approximately 33% from the month he took the CEO position in 2006 to the month he was appointed as the managing director in 2010.

While Mr Hickman's board membership could be explained by the founding member of the company, Ryman Healthcare Limited seemed to have the CEO on the board when the CEO proved his ability by generating strong firm performance.

7.12 The Warehouse Group Limited

The Warehouse Group Limited was established in 1982, initially selling imported and manufactured clearance lines in Takapuna, Auckland.[10] The Warehouse has subsequently grown to become one of NZ's largest general merchandise retailers. The company also owns The Warehouse Stationery. The Group was listed in late 1994.

Mr Stephen Tindall was the founder of The Warehouse Group Limited. When the company went public in 1994, he assumed the role of managing director of the Group. In 2000, he announced he would withdraw from day-to-day management but retain the board seat. Mr Greg Muir was hired in 1999 with the understanding that he would spend two years as the Chief Operating Officer while being groomed as Mr Tindall's successor. Mr Muir assumed the CEO role in January 2001 but did not become a board member.

If it is a tradition that a company founder needs to evaluate his or her successor before making board membership decision (as in Ryman Healthcare's case), Mr Nuir did not remain in the position long enough to let it happen. He resigned as the CEO in 2003, just two years after taking over the role. His resignation was due to, citing from Mr Muir,

[10]It was previously known as Anorco Number Fifty Eight Limited until 1994

"differences with the board". According to Mr Tindall, Mr Muir and the board agreed on what should be done, but disagreed on the way to do it.[11] In an interview, Mr Muir said it was crucial for anyone replacing a company founder to find out the extent to which that person wanted to walk away.[12] Mr Tindall, on the other hand, advised that the board needed to find a CEO who was comfortable with life the way the owner wanted it.

After Mr Muir's departure, Mr Tindall stepped in as a temporary replacement until a new CEO was found. In May 2004, Mr Ian Morrice was appointed as the managing director. On his appointment, he was open about the problems the company was facing. According to an article from NZ Management, the frankness of Mr Morrice suggested the board was more receptive to constructive criticisms than it was when Mr Muir vacated. It took the board a year to find the replacement and Mr Morrice was greatly entrusted by the board.[13] On his appointment, he was keen to develop new strategies after gaining agreement on the group's broader strategies.

The Group experienced multiple changes in CEO board membership but the governance environment did not change significantly over the sample period. It seemed that the founder, Mr Tindall, played a key role in CEO board membership decision, in particular when comparing his attitudes towards Mr Muir as CEO and Mr Morrice. The key difference was that when Mr Muir was the CEO, Mr Tindall insisted the CEO should fill in the owner's shoes whereas when Mr Morrice was appointed, Mr Tindall expected an innovative approach to both management and strategy. He said "(t)he board realized the company needs to adopt a very broad brief where there was no givens and everything is negotiable". Under this change of attitude, the company board might be more willing to give the new CEO power at the board level to discuss new strategies.

7.13 Wakefield Health Limited

The company originated back to 1929 as Lewisham Hospital. After a major acquisition in 1987 and an ownership change in 1989, it was renamed Wakefield Hospital Limited. In August 2005, the company was renamed as Wakefield Health Limited. Wakefield is the

[11] see http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=3504883

[12] see http://www.sharechat.co.nz/article/02114740/goodbye-to-all-that.html

[13] http://www.archivesearch.co.nz/?webid=mgt&articleid=16779

largest private hospital in NZ, and includes six operating theaters, five intensive care beds, three coronary care beds, and 20 apartments.

Mr Richard Barnes joined the company in 1990 as the CEO and was appointed to the board in 1994. On 13 September, 2005, the company announced that it had agreed on terms for a merger with Royston Hospital Limited, a private surgical hospital based in Hastings. After the merger, Royston would hold approximately 39% of the shares in the merged company. The announcement also stated the merged company would have a board of eight directors, chaired by John Calder - the chairman of Wakefield Health Limited, and two of the existing Wakefield Health directors would have to retire and Royston could nominate three directors. As a result, Mr Barnes resigned from the board in January 2006. The 2006 annual report states that Mr Barnes' resignation was to reduce the nominal "headcount". In addition, "(a)s Chief Executive he of course attends all Board meetings anyway, as do other senior executive, so input at Board-level is not affected". At the early stage of the merger, the company had a temporary expansion of the board to ten directors with the understanding that a reduction in the number would be expected after the transition.

In Devember 2006, the company announced Mr Barnes's retirement as the CEO, effective 31 March, 2007. According to Mr Calder, Mr Barnes' expressed his intention to retire some considerable time ago. He and the board worked together to ensure a smooth succession transition. Mr Andrew Blair, who was the Chief Operation Officer and also was the CEO of Royston Hospital Limited, was appointed to the CEO position of the company. As expected, Mr Blair was not appointed to the board, for the obvious reason to maintain the board size. In 2007 and 2008, the company achieved a board size of eight members.

7.14 Summary

Out of the 12 firms that switched their CEO board membership choice over the sample period, 9 firms switched from CEO on the board to CEO off the board and the other 3 firms experienced multiple changes.

All the changes associated with switching away from the board were associated with

a change in the CEO. These changes were often accompanied by a change in firm's major shareholder (eg., Charlies' Group Limited, Contact Energy Limited, Cue Energy Resources Limited, Genesis Research and Development Corporation Limited, Metlifecare Limited, Wakefield Health Limited) and strategy (eg., Charlies' Group Limited, Contact Energy Limited, Cue Energy Resources Limited, Limited, Lyttelton Port Company Limited, Metlifecare Limited), and two were associated with the intension to decrease the board size after a merger or acquisition (Contact Energry and Wakefield Health Limited).

The three firms that experienced multiple changes were Charlies' Group Limited, Lyttelton Port Company Limited, and The Warehouse Group Limited. Charlies' Group Limited first switched by having a new CEO off the board after a change in business strategy and then switched again by having the acquiring company's founder on the board as the managing director after the acquisition. Lyttelton Port Company Limited switched by having its existing CEO on the board following generating strong performance. However, generating profits at the expense of other stakeholders caused a number of controversies. The company responded by a number of measures, including a change in the CEO and the new CEO was off the board. The Warehouse Group Limited's multiple switches were possibly the result of the change in company founder's attitude towards the role of the CEO.

Chapter 8

Conclusions

The primary objectives of this thesis are to explore and examine the determinants and financial implications of CEO board membership. To the best of my knowledge, there are no empirical studies that focus on the extent of CEO participation on the board in their own companies and even theoretical discussion on this topic is rare. The reason for the gap in the literature may be that virtually all CEOs sit on their company board in some countries, such as the US and Portugal, and a majority of them even hold the chairman role. However, approximately 30% of NZ CEOs were off their company board between 1997 and 2008 and this figure also had an increasing trend during the sample period. The stylized fact that New Zealand firms, unlike those in many other countries, exhibit significant variation in the extent to which CEOs are involved with their board, provides a unique opportunity to explore these issues. My thesis provides a starting point for the analysis of the inclusion of an additional layer of CEO board involvement and documents evidence for CEO board membership studies. Furthermore, past NZ corporate governance studies have almost exclusively concentrated on a number of board characteristics on firm performance (eg, Hossain et al., 2001, Prevost et al., 2002b, Reddy et al., 2010, Elayan et al., 2003). A small number of research has been conducted on the determinants of board characteristics themselves and none on board leadership structure.

Theoretical Framework

The thesis begins with an establishment of a theoretical framework which involves two approaches to explaining the observed choice of CEO board membership. Under the share-

holder value maximization approach, the observed CEO board membership is an optimal response to firms' operating environment after considering the benefits and costs of each alternative. CEOs are on the board when the benefits of doing so outweigh the costs, and these firms should be associated with higher firm performance than firms that choose to have CEOs off the board. Contrary to the shareholder value maximization approach where CEO board membership is a mechanism to maximize shareholder wealth, under the managerial utility maximization approach, the observed CEO board membership is an outcome of CEOs' pursuit of personal interests. Due to the conflicting interests between shareholders and CEOs, CEO board membership may be associated with lower firm performance. Following the establishment of this theoretical framework, I identify two operating segments, which affect the probability of CEO board membership under the theoretical framework, and they are the opacity of firms' information environment and the strength of firms' governance environment.

Determinants of CEO Board Membership

With a sample of 152 publicly listed NZ firms over the period of 1997 to 2008, the overall results suggest that the observed CEO board membership decision is affected both by some proxies of information opacity and governance strength, and it is at least partially driven by CEO interests. Specifically, I find that (i) the probability of CEO board membership is positively related to firm size and non-linearly related to firm age; and (ii) CEO board membership is positively related to board size, negatively related to the percentage of independent directors on the board, board ownership and board abilities. The negative association between the probability of CEO board membership and the strength of firms' governance environment can be explained by the managerial utility maximization argument.

By extending the analysis to explore the determinants of CEO board membership, I then analyze the determinants of CEO board involvement. I divide firms with CEOs on the board into firms with CEO-director and firms with CEO duality. Hence, CEO board involvement is classified into three categories: CEOs off the board, CEO-director and CEO duality.

The analysis shows that a number of explanatory variables have a non-linear relation-

ship with the degree of CEO board involvement. For example, CEO board involvement is negatively related with firm age, multiple directorships in independent companies, and positively related to firm age squared and multiple directorships in independent companies squared; it is positively related to Tobin's Q ratio and percentage of independent directors on the board, and negatively related to Tobin's Q ratio squared and percentage of independent director on the board squared.

The recognition of these non-linear relationships can potentially have significant contributions in the corporate governance literature. This is an important finding since past literature assumes a linear association between these variables and CEO duality. The lack of literature on firms with CEO-director may falsely attribute the resulting relationship to CEO duality rather than CEOs being on the board.

Performance Implications of CEO Board Membership

After analyzing the determinants of CEO board membership and board involvement, this research continues with the examination of the effect of CEO board membership on firm performance where firm performance is measured by ROA, ROE and Jensen's alpha. The results from the basic regression analysis consistently show that CEO board membership is positively related to all three measures of firm performance, indicating the benefits of CEO board membership outweigh the costs in these firms and providing evidence for shareholder value maximization.

I then check the robustness of these results by controlling for self-selection bias and including other governance variables. I find the positive relationships disappear for accounting-based performance measures after controlling for the positive self-selection bias. Specifically, given the statistically insignificant coefficient for CEO board membership in these models, firms' accounting performance is indifferent between both groups of firms. This suggests firms with better accounting performance tend to appoint their CEOs on the board. After controlling for this bias, CEO board membership decision is irrelevant in determining firms' accounting performance. Hence, CEO board membership is optimally chosen given the underlying firm characteristics. On the other hand, the result from the market-based performance measure - Jensen's alpha - indicates that CEO board membership is positively associated with Jensen's alpha after the negative self-selection bias

is accounted for. This provides an evidence for shareholders' value maximization. In addition, the positive relationship between CEO board membership and firm performance cannot be explained by other governance variables.

I also examine the performance implications of different degrees of CEO board involvement. I find that the highest degree of CEO board involvement (CEO duality) and the lowest degree of CEO board involvement (CEOs off the board) are both associated with lower accounting performance compared to CEOs on the board. However, the stock market perceives CEO duality positively and CEOs off the board as undesirably. However, these results are significantly affected by the self-selection bias. Specifically, when firm performance is accounting-based, the evidence shows that after taking the self-selection bias into account, the costs of CEO duality still outweigh the benefits in dual firms, providing evidence for the managerial utility maximization argument. However, the evidence for CEOs off the board shows that after the self-selection bias is taking into account, firms with CEOs off the board perform indifferently to firms with CEO-director, suggesting CEOs off the board is chosen optimally after considering its benefits and costs. When firm performance is market-based, both dual firms and CEO-off-the-board firms are affected by positive self-selection effects. After taking into account these effects, the coefficient for CEO duality is statistically insignificant, suggesting CEO duality does not significantly affect Jensen's alpha whereas the coefficient for CEOs off the board is negative, suggesting that the costs of CEOs off the board are greater than its benefits, reflecting managerial utility maximization. Furthermore, the robustness check of including other governance variables provides the same evidence as in the basic regressions for dual firms and CEO-off-the-board firms with accounting performance measures - both groups of firms are associated with lower ROA and ROE. The difference is that both groups of firms are indifferent to CEO-director firms in terms of Jensen's alpha.

Case Studies

To further complete the analysis of the CEO board membership issue, I conduct case studies for firms that switched the choice of CEO board membership over the sample period. In all cases, firms are reluctant to disclose the reasons for the change in their choice, however some patterns may be observed.

First, all twelve firms that changed their CEO board membership choice over the sample period switched from CEO on the board to CEO off the board and among these firms, three firms experienced multiple changes. Second, all the changes associated with switching away from the board were associated with a change in CEO, accompanied by a change in firms' major shareholder and/or strategy. Third, there seems to be a phenomenon in NZ that is similar to the "pass the baton" succession process in the US where the board of directors evaluates the newly appointed CEOs' performance (mainly through firm performance) before appointing them to the board.[1]

Limitations

The first research limitation is that this projected commenced in 2009, thus the sample period for this research does not cover the most recent data. The extension of the sample period to the most recent years may (i) provide the most recent development of CEO involvement on NZ boards; (ii) provide more information, hence increase the explanatory power of the models.

Second, although this research makes attempts to examine the determinants and financial implications of different degrees of CEO board involvement, due to the small number of firms with dual structure in NZ and in my sample, the means and standard errors calculated based on a small sample size are sensitive to extreme values, which is likely to result in inaccurate means and standard deviations, thereby affect t values. Hence, the analysis results regarding CEO board involvement should be treated with caution when generalizing into a larger sample.

Future Research

This research finds that CEO board membership does not contribute negatively to firm performance and there is even a weak evidence of a positive effect when the market return

[1]Vancil (1987) suggested the term "pass-the-baton" process, which refers to the case when the CEO-chairman is about to retire, a new CEO is appointed and the former CEO-chairman holds the chairman role only. The new CEO is trained and carefully evaluated for possible promotion to the chairman position. If the new CEO performs at a satisfactory level, he or she will be rewarded to dual role of CEO and chairman after the former chairman retires.

is used as a performance measure. An immediate question to ask is why some countries do not adopt this level of CEO board involvement and why NZ is so different in the number of CEOs sitting on boards compared to other countries. This question is a worthwhile topic of future research. A possible direction for this topic may be to compare institutional, legal, cultural differences between NZ and other countries, such as the US, and investigate whether these differences reflect different levels of agency costs, which contribute to the difference in CEO board membership. By answering this question, it could potentially enhance people's understanding of CEOs' role in board activities in different countries and the implications of their board participation.

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Appendix A

Appendix

A.1 Firms Added and Removed From Roberts' Sample

This appendix reports the firms added and removed from Roberts' sample between 1997 and 2008. The added firms are mainly those that were deleted due to insufficient disclosure of information for Roberts' research; the removed firms are those whose annual reports are unavailable in the NZX Company Research or the disclosed information is insufficient.

Year	Added Firms	Deleted Firms
1997	Mainfreight	Brierley International
	NZ Experience	Cube Capital
	Richina Pacific	Eastern Equities Corp Ltd
	Tourism Holdings	Enerco NZ
		Iddison Group Vietnam
		LWR Industries
		Independent Press
		Pacific Retail Group
		Shortland Properties
		St. Lukes Group

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Year	Added Firms	Deleted Firms
		Tasman Agriculture
1998	Affco Holdings	Apple Fields
	Auckland Airport Authority	Carter Holt Harvey
	Cue Energy Resources	Dairy Brands
	Dominion Breweries	Ebos Group
	Donaghys	Fletcher Challenge
	Paynter Timber	LWR Industries
	Pure NZ	Pacific Retail Group
	Northland Port Corporation	Roller International
	Sanford	St. Lukes Group
	Tourism Holdings	Tasman Agriculture
1999	Bradway Industries	Dairy Brands
	Heritage Gold	Pacific Retail Group
	Metlife Care	
	Mr Chips Holdings	
	PGG Wrightson	
	Richina Pacific	
	South Port New Zealand	
	Taylors Group	
	Tourism Holdings	
2000	Broadway Industries	Eldercare NZ
	Capital Properties	IT Capital
	Paynter Timber	Pyne Gould Guinness
	Frucor	Sky Network Television
	GDC Communications	
	Genesis R&D	
	Metlife Care	

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Year	Added Firms	Deleted Firms
	Mr Chips Holdings	
	Owens Group	
	Richina Pacific	
	Ryan Healthcare	
	Telecom Corporation NZ	
	United Networks	
2001	Affco Holdings	Eldercare NZ
	Broadway Industries	IT Capital
	Capital Properties	
	Kirkcaldies & Stains	
	Pure NZ	
	Mr Chips Holdings	
	Natural Gas Corporation	
	Owens Group	
	Richina Pacific	
	Richmond	
	Software of Excellence	
	Vending Technologies	
	Wakefield Hospital	
	Wellington Drive Technologies	
2002	Allied Farmers	Eldercare NZ
	Apple Fields	IT Capital
	Blis Technologies	Pacific Retail Group
	Briscoes	Pyne Gould Guinness
	Broadway Industries	
	Mooring Systems	
	CDL Investment	

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Table 55 – continued from previous page

Year	Added Firms	Deleted Firms
	Mr Chips Holdings	
	Natural Gas Corporation	
	NZ Refining	
	Owens Group	
	Tower	
	Trust Power	
	Wakefield Hospital	
2003	Apple Fields	Pacific Retail
	Broadway Industries	Pyne Gould Guinness
	CDL Investment	Sky Network TV
	Dorchester Pacific	
	Lyttelton Port	
	Media Technology	
	Newcall Group	
	Northland Port Corporation	
	NZ Experience	
	Pacific Edge Biotechnology	
	Sanford	
2004	Allied Farmers	Cadmus Technology
	Apple Fields	Feltex
	Broadway Industries	Sky Network TV
	CDL Investment	
	Dorchester Pacific	
	Evergreen	
	Beauty Direct	
	NZ Experience	
	Pacific Edge Biotechnology	

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Table 55 – continued from previous page

Year	Added Firms	Deleted Firms
	Designer Textiles NZ	
	Postie Plus Group	
2005	Apple Fields	
	CDL Investment	
	Charlies	
	Cue Energy Resources	
	Dorchester Pacific	
	Evergreen	
	Beauty Direct	
	Metlife Care	
	NZ Experience	
	Port of Tauranga	
	Provenco Cadmus	
2006	Allied WorkForce	
	Botry-Zen	
	CDL Investment	
	Contact Energy	
	Kirkcaldie & Stains	
	Methven	
	New Image Group	
	Pacific Edge Biotechnology	
	Designer Textiles NZ	
	Port of Tauranga	
	Postie Plus Group	
	Scott Technology	
	Sky Network TV	
	Smiths City	

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Year	Added Firms	Deleted Firms
	Southern Capital	
	Tenon	
	Tourism Holdings	
	Training Solutions	
	TranzRail Holdings	
	Turner Auctions	
	Vector	
	Vending Technologies	
2007	Cadmus Technology	Allied WorkForce
	Fletcher Building	
	Hellaby Holding	
	NZ Refining	
	Ryman Healthcare	
	Seeka Kiwifruit	
	Smartpay	
	Vector	
2008	None	None

A.2 Summary Statistics of Logged Real Sales

Table 56 Summary Statistics of Logged Real Sales

This table reports natural logged form of real sales summary statistics from 1997 to 2008 with a sample size of 972. The data were calculated based on 1997 values.

Year	Sample Size	Mean	Median	Standard Deviation	Maximum	Minimum
1997	72	11.23	11.55	2.30	14.95	2.48
1998	81	11.06	11.37	2.44	15.03	-1.63
1999	76	11.29	11.41	2.00	15.04	3.30
2000	81	11.20	11.25	2.13	15.25	2.71
2001	87	11.06	11.16	2.27	15.83	4.20
2002	82	11.04	11.31	2.46	15.44	2.73
2003	84	11.02	11.36	2.37	15.36	4.37
2004	82	10.96	11.21	2.45	15.37	3.67
2005	81	10.91	11.48	2.42	15.41	3.56
2006	85	11.00	11.38	2.35	15.28	3.71
2007	80	11.02	11.55	2.47	15.36	3.89
2008	81	11.10	11.64	2.52	15.50	3.87
All Years	972	11.07	11.37	2.34	15.83	-1.63
Jarque-Bera	324.94					
Summary Statistics of Logged Annual Sales after Winsorization						
All Years	972	11.09	11.38	2.24	15.01	4.77
Jarque-Bera	129.61					

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A.3 Theoretical Rationale for Firm-Level Clustering

It is assumed that the data generating process is given by $y = X\beta + \varepsilon$
where X and ε are independent and $\varepsilon \sim N(0, \Omega)$ with 0 being the mean and Ω being the variance of the error term.

The OLS estimator of β is $\hat{\beta}_{OLS} = (XX)^{-1}X'y$ and $Cov(\hat{\beta}_{OLS}) = (XX)^{-1}X'\Omega X(XX)^{-1}$. When $\Omega = \sigma^2 I$ (σ is the standard deviation of the error term), $Cov(\hat{\beta}_{OLS}) = \sigma^2(XX)^{-1}$. $\hat{\beta}_{OLS}$ is important for measuring effects and $Cov(\hat{\beta}_{OLS})$ is important for constructing confidence internal and hypothesis testing. When the error term exhibits non-spherical characteristics, ie.,$\Omega \neq \sigma^2 I$, the OLS estimator of β is not efficient and the OLS estimator of $Cov(\hat{\beta}_{OLS})$ is biased and inconsistent. An inefficient OLS estimator means there is another estimator that is closer to the true value and the biased and inconsistent covariance causes problems for hypothesis testing and construction of confidence interval. Firm level clustering technique chooses an appropriate Ω that allows for completely general serial correlation within a 'cluster'.

A.4 Marginal Probabilities of CEO Board Membership based on Model (6)

Table 57 Marginal Probabilities of CEO Board Membership based on Model (5) of Table 23

This table reports the marginal changes in the probabilities of CEO board membership using the output from Model (6) in Table 23. These marginal effects are calculated at the mean and median values of the explanatory variables. Terms in parentheses are standard errors. The significance levels are indicated with ***,**,* denoting statistical significance at the 1%, 5% and 10% level, respectively.

	Means	Medians
	(1)	(2)
Ln Market Capitalization	0.082***	0.077***
	(0.027)	(0.022)
Number of Business Units	0.009	0.009
	(0.021)	(0.020)
Number of Location Units	0.031	0.029
	(0.041)	(0.041)
Number of Years Listed	−0.016**	−0.015*
	(0.007)	(0.008)
Number of Years Listed Squared	0.0002*	0.0002
	(0.000)	(0.0002)
Tobin's Q Ratio	-0.014	-0.013
	(0.030)	(0.027)
Board Size	0.017	0.016
	(0.019)	(0.018)
Percentage of Independent Directors	−0.005***	−0.005***
	(0.002)	(0.001)
Board Ownership	−0.003**	−0.002**
	(0.001)	(0.001)
Multiple Directorships(Independent)	−0.002***	−0.002***
	(0.001)	(0.001)
Block Shareholdings(%)	-0.001	-0.001
	(0.001)	(0.001)
No. of Observations	839	839

A.5 Regression Results of Determinants of CEO Board Involvement with Market Capitalization

Table 58 Regression Results of Determinants of CEO Board Involvement with Market Capitalization

This table reports the results of a ordered probit regression estimating the determinants of CEO board involvement where firm size is measured by market capitalization. Coefficients are reported in the table and P-values are based on robust standard errors with firm level clustering and reported in parenthesis. ***, **, * denotes significance at the 0.01, 0.05, 0.1 level.

	(1)	(2)	(3)
Ln Market Capitalization	0.149**	0.181***	0.140**
	(0.066)	(0.067)	(0.067)
Number of Business Units	-0.005	-0.037	0.148
	(0.053)	(0.056)	(0.176)
Number of Location Units	-0.050	0.032	0.142
	(0.130)	(0.105)	(0.293)
Firm Age	0.002	-0.002	−0.028**
	(0.006)	(0.006)	(0.012)
Tobin's Q Ratio	-0.040	-0.046	0.073
	(0.068)	(0.078)	(0.101)
Board Size		-0.049	0.174
		(0.055)	(0.256)
Percentage of Independent Directors(%)		−0.012***	0.036**
		(0.004)	(0.016)
Multiple Directorships(Independent)		-0.002	−0.017***
		(0.003)	(0.007)
Board Ownership(%)		−0.006**	-0.008
		(0.004)	(0.010)
Block Shareholdings (%)		-0.005	0.016
		(0.004)	(0.016)

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	(1)	(2)	(3)
Quadratic Effects			
Number of Business Unites			-0.025
			(0.024)
Number of Location Units			-0.023
			(0.053)
Firm Age			0.0004***
			(0.0001)
Tobin's Q Ratio			-0.016
			(0.015)
Board Size			-0.014
			(0.016)
Percentage of Independent Directors(%)			−0.0004***
			(0.0001)
Multiple Directorships(Independent)			0.0001**
			(0.000)
Board Ownership(%)			0.000
			(0.0002)
Block Shareholdings (%)			-0.0002
			(0.0002)
Boundary Parameters			
limit 1	1.017	-0.218	1.935
limit 2	3.750	2.699	4.959
Control Variables			
Debt Ratio(%)	0.001	0.002	-0.004
		(0.004)	(0.003)
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
No. of Observations	900	867	867
Pseudo R^2	0.264	0.317	0.354